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Dr. Barton, Indiana University Professor of Geography, was a Visiting Professor at the College of Education, Krung Thep, Thailand, for two years (1955-1957). He is senior author of *An Economic Geography of Thailand* (in Thai), published by the Ministry of Education in Thailand in 1958. His article, "Railroads in Southeast Asia," appeared in the January, 1960, issue of the JOURNAL OF GEOGRAPHY.

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Professor White, Chairman of the Department of Geography, the University of Chicago, is a well-known specialist on water resources and the management of natural resources. Author of numerous articles and reports, the most recent book of which he is senior author is entitled *Changes in Urban Occupance of Flood Plains in the United States*, published in the Chicago Research Papers. He is interested in various facets of geography and fortunately one of these phases is geography in education.

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GROWING RICE IN THAILAND*

THOMAS FRANK BARTON
Indiana University

Relative Importance

IN THAILAND one of the morning greetings is *Ghin kao laael yung.* Translated, this greeting means "Have you eaten rice?" or "Have you had something to eat?" And in Thailand if you are an Asian and you have eaten, you have had rice.

On the average, a Thai consumes about 1.2 pounds of rice per day.[1] Perhaps it is more meaningful to say that in four months a Thai eats a quantity equivalent in weight to that of his body. In a year the rice he consumes will amount to about three times that of his body weight.

Although Thailand is one of the largest export rice producing countries in Asia, so much is consumed within the country that only about one and one-third million tons are available for export.[2] Yet between 40 and 50 per cent of the country's total income from export is from the sale of rice.

Throughout its written history, Thailand has always had an agricultural economy. About 80 per cent of Thailand's working population is engaged in agricultural activities, and, according to the latest surveys, more than four-fifths of the Thai farmers own their own farms. These contain approximately nine-tenths of all the cultivated land in the country,[3] and *paddy*[4] is the principal cash crop on most of these farms. (Nearly all farmers raise the rice they eat.)

Rice Producing Areas

In spite of the emphasis on production and the intensive use of land, most of the rice areas are comparatively small, vary in size, and are scattered throughout the country (Fig. 1). Even the largest and most wide-spread farm areas occupy clearings in the forest and jungle. In 1950 land held in farms amounted to less than one-fifth of the entire domain. The country's total area is approximately 198,000 square miles or about 127 million acres. Of this, only about 23 million acres are classified as "farm holding land" (land held in farms).[5] As late as 1950

* Most of the basic concepts in this paper are a part of an illustrated lecture entitled "The Rice Industry of Thailand" which was presented as the National Council for Geographic Education banquet address at St. Louis on November 29, 1957.

Through the courtesies received from President Saroj Busari, the College of Education, Krung Thep, Thailand, and many other Thai, this article is based on seasonal field observations made in 51 of Thailand's 71 changwats during a two year period (June, 1955 to May, 1957).

[1] Ladejinsky, W. I., "Thailand's Agricultural Economy," *Foreign Agriculture,* VI (1952), 169.

[2] Between 1949-1956 the average annual production amounted to about 7.1 million metric tons and the annual export was 1.3 million metric tons.

[3] Three general references printed in English by the Thailand Ministry of Agriculture, Division of Agricultural Economics are: (1) *Areas of Thailand by Province and Region, 1950;* (2) *Thailand Economic Farm Survey, 1953;* and (3) *Agricultural Statistics of Thailand, 1955.*

[4] In Thailand *paddy* refers to rough, unhulled rice (grains) and to the small diked fields in which lowland irrigated rice is grown. Also in Thailand, paddy is spelled *padi. Padi* fields are small diked fields.

[5] Thailand Ministry of Agriculture, Division of Agricultural Economics, *Areas of Thailand by Province and Region, 1950.*

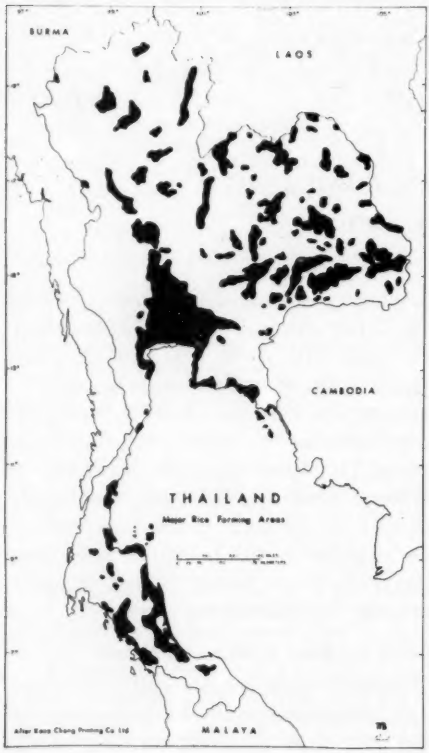

FIG. 1

nearly three-fifths of the country was still a part of the public domain and classified as "forest land."

About 64 per cent (about 15 million acres) of the land held in farms is planted to paddy. This means that in the entire country less than one acre in eight produces rice. In contrast upland crops and tree crops occupy less than 4 per cent of the total area of the country.

The most extensive and productive rice producing region is found on the delta and flood plain of the Chao Phraya River in the southern part of the Central Plain Region. This alluvial plain, which is sometimes called the Bangkok Plain, is just north of the mangrove swamps which border the seaward and salty margins of the delta.

Types of Rice Cultivation

The Thai raise three general types of rice, namely (1) garden (in small plots), (2) floating or deep-water, and (3) upland. Methods of rice cultivation vary according to established customs and to the amount and availability of water. The latter in turn varies because of differences in rainfall (and other weather conditions), topography, and soil.

Sometimes the term wetland and dryland are applied to rice production. Wetland rice requires natural flooding and/or irrigation. Most varieties of rice grown in irrigated fields need about 70 inches of water to make a good yield, yet most changwats (provinces) receive less than 60 inches of rainfall. Consequently, wetland rice fields must receive water from the run-off of non-cultivated land in addition to direct rainfall. Both garden and floating rice are types of wetland cultivation. Dryland, or upland, rice is not irrigated; the crop must develop on the limited amount of water which falls as rain.

Three methods are used to plant this crop. Upland rice is usually planted by dibbling. The broadcasting method is used for both floating and garden types. Only the garden rice is transplanted. Statistics are not available concerning the number of acres planted to each of these three types or the relative number of acres planted by each of these methods. However, it is estimated that the upland type totals less than ten per cent (perhaps as low as five per cent) of the entire yield and that about 80 per cent of the wetland rice is transplanted.

Upland Rice[6]

Upland rice is grown by hill people

[6] Any crop grown in Thailand without the aid of irrigation is called an upland or dryland crop. The terms "dryland rice" and "upland rice" are used interchangeably.

and by pioneers who are making permanent clearings in the forest. Thus this type is found on the margins of wetland rice areas. More specifically, it is grown: (1) in the hills adjacent to the floodplains; (2) along new transportation lines where the forests are being cleared and the land occupied permanently; (3) in temporary clearings which have been cut in the forest and jungle which border all wetland rice producing areas, and (4) in wooded areas near rather extensive grazing lands. Some farmers in Northeast Thailand make a living primarily by raising livestock and enough rice in small paddies for family use. Nearly all of the crop grown by this method is used for subsistence or as seed.

The upland fields are found interspersed in the forests and not in grassy areas. With their simple tools, the farmers can remove the forest vegetation but not cogan grass. In addition, the surrounding forest and jungle reduce the wind velocity and protect the crop and field from excessive evaporation. The farmers believe that in these clearings the humidity is higher.

Regardless of the site selected, the fields for the growth of upland rice are prepared in the same general way. The farmer selects his potential fields early in the dry season after he has harvested his previous year's crop. At this time the vegetation is not dripping wet and some of the trees and vines will be without their leaves. Insects and disease are less prevalent. Trees are "ringed." Some of the trees which die and dry out more quickly than others are cut.[7] Brush is chopped down with a sturdy short-bladed knife used as an ax. It is then piled haphazardly in wind rows or around fallen trees to facilitate burning. At the end of the five or six months' dry season, the vegetation and jungle floor are extremely dry and the clearing is burnt in April or May just before the rains come. The plant nutrients in the wood ash plus the nutrients stored in the ground from the decay of leaves prove sufficient for one good crop and perhaps a poorer second crop.

Either just before[8] or after the early rains moisten the soil, the farmer plants the newly cleared land by using a pointed bamboo stick or an iron-tipped tool. Holding the stick in one hand, he jabs it into the ground, making holes about an inch deep. With his other hand, he drops a few unsprouted rice seeds in it and closes the hole with his foot. Upland rice requires only a four month, or less, moist growing season.

Perhaps twice during the growing season the farmer weeds and pulls up or cuts down the tree suckers. This removal conserves the limited moisture for the grain and keeps the rice plants from being choked out. After the first or second year, the field is abandoned unless it is to become a permanent clearing where paddy fields are constructed by building dikes to hold the water. When the former practice is followed, this method of regularly abandoning fields is called "shifting cultivation." This type of farming is: (1) very destructive to forests and is the antithesis of proper forestry management; (2) produces sheet, rill and gully erosion; and (3) contributes to the erratic flow of the rivers.

Often the cultivator lives some distance from his small clearings. The fields require little labor. Once the land is cutover, it only takes a few days to burn the slash. Later, a few days at a time with long intervals between are spent in planting, weeding, cutting and threshing. Some build a temporary shelter adjacent

[7] In new clearings along a new highway leading to the Chainat Dam which is only about 165 miles north of Krung Thep, I saw gasoline-motored chain saws in operation during the dry season of 1957.

[8] Thailand Ministry of Agriculture, *Agriculture in Thailand*, Bangkok, Thailand, 1957, 5.

to or in the field. However, this is seldom occupied for more than a few weeks during the year.

Wetland Rice

Plowing. Whether the rice is planted by broadcasting or transplanting, the first step is to plow the land as early as possible in the rainy season. With the exception of peninsular Thailand, the rainy season starts in May or June. Cultivation begins several weeks after the rains come. The first precipitation is absorbed quickly by the parched and baked earth. During the dry season, often lasting five to seven months, the fields can become so dry and hard that it is nearly impossible to sink a mattock in the ground. The water table drops and deep cracks appear. Most of the buffalo mud wallows, ponds, intermittent lakes and swamps, ditches and small canals are dry. Some types of fish burrow down into the ground to find moist conditions where they can stay alive. Consequently the first rains do not make the ground soft enough to plow unless the fields also receive run-off. Moisture from the first rains runs into the cracks; the soil swells and the ground becomes water tight again. Then the water from later rains, and/or irrigation ditches, standing in the fields a few days or weeks softens the ground and kills the weeds.

As a rule plowing does not start until June, and most of it takes place in early July or later if the rains do not start in May or are inadequate in amount. Some plowing is done during the cool season of December, January, and February if irrigation water is available in sufficient quantity to permit the growing of two crops per year or where on-shore winds of the winter monsoon bring rains to the eastern part of peninsular Thailand.

Nursery beds. The farmer selects one of his most accessible and fertile fields near his compound (farmstead) or at the edge of the village as the site of his nursery bed. This field must be strategically located so that the first rains may be supplemented by surface run-off from other fields or from irrigation ditches. It should also be accessible to the compound to receive the buffalo, oxen and poultry manures or commercial fertilizers. If these are used anywhere on the farm, the nursery bed is favored.

As soon as fresh rain water (in contrast with stagnant water with less oxygen) is available, it is let into or pumped into this bed. When the ground becomes soft, it is plowed and cross-plowed. The home-made wooden plow has a pointed share usually tipped with iron, but it has no moldboard. The soil is stirred, not turned over. Water buffaloes are used where the mud is deep, sticky and primarily clay in nature. In the lighter soils containing more sand and/or silt, bullocks are used. After the field is plowed several times, water is allowed to stand and the land is permitted "to weather." The water helps rot the vegetable matter; it penetrates the clods, and it may settle below the plow line, softening the ground to a greater depth.

Planting time varies in different parts of the country, but the farmer generally plans to sow his nursery bed about 25-30 days before his first field is ready for transplanting.[9] The number of superior nursery bed sites is so limited that the preparation and use of these are often a cooperative undertaking. One farmer may contribute the land. Another will plow it. Still another may harrow it. They may divide the field into several plots, each one planted to a different type of rice, such as short, medium, and long maturing varieties. Rice maturing in a short growing period is placed on land farthest from the irrigation supply where water will stand for the shortest time. The yield here will not be as high;

[9] *Ibid.*, 8.

the crop may fail; and, in some dry years, these plots are not even planted.

The farmer sprouts the seeds before they are sown. They are first soaked in water overnight and then scattered on split bamboo trays or other containers permitting adequate drainage. The seeds on the trays are covered with wet straw to hasten germination. These are sprinkled at least twice daily to prevent overheating, and, after being covered in this way for forty-eight hours, the sprouted seeds are ready to plant.

While they are sprouting, the plot is harrowed several times and the ground thoroughly puddled. Soil, water and air are so well blended that the mixture resembles a well-beaten cake batter. All clods and trash are removed. Next the plot is drained and the mud leveled with a piece of wood or a large banana stalk pulled by one or more persons (only hand labor is used in the final stages of preparing this bed).

After leveling, the mud is left for a few hours to set so that the sprouted seeds, when sown, will not sink too deeply. Young plants from seeds which settle too far into the mud will become too tightly set. And when they are uprooted for transplanting, too high a percentage of the root system will be lost. When too many roots are broken off, the plant will not grow or produce well.

When the bed is ready and the seeds sprouted, they are sown broadcast. The sowing takes place in the morning, and afterwards this bed is carefully guarded. A temporary bamboo fence is built around it to keep out buffaloes and bullocks. If located near the village, a bamboo lattice is put around the field to keep out chickens and ducks. For the first few days after the sowing, either someone stays near the field to shoo away the birds, or scarecrows are set up.

Fortunately, the nursery is planted early in the wet season before the rains become too frequent and heavy. After sowing, the bed is left to dry for a week. Then water is let in a little at a time, and the height of the seedlings is determined by controlling the water. In some parts of Thailand where water is scarce and the fields are covered with only a few inches, short seedlings are preferred. These are also desirable where the fields are least accessible to water.

Field preparation. While the seedlings are growing, the farmers quickly prepare the fields for transplanting. Often the plots are plowed only one way and then harrowed. This latter process both puddles the soil and levels the ground. Trash (such as undecayed stalks, roots of weeds, and leaves) is removed and placed on termite hills or paddy dikes (sometimes called bunds).

Ordinarily a single buffalo, usually driven by man, is used in plowing. Sometimes on the Bangkok delta plain two buffaloes in double harness are used for deeper plowing in the sticky clay. Often women or older girls may be seen plowing, especially on the delta where labor is in short supply and where there is less exchange of local help.

Two buffaloes are used to harrow the field. The harrow is heavier than the plow. The teeth stick down deep into the mud, and it takes strength to pull it as it churns the soil, water and air into the right mixture and texture. Guiding the harrow is heavy work carried on by men. In the clay soils, such as those in the Bangkok plain, about one-third of the water required for the crop is used in wetting and puddling the soil.

Plowing and harrowing are done in the morning between the hours of six and ten and in the evening between three and six. Buffaloes are not worked during the intense heat of the day. The animals rest in shallow water or in mud wallows. The field workers bathe, eat, and then rest in the shade.

The last harrowing is done just before the transplanting. Often the two processes are carried on in the same paddy field at the same time.

Transplanting

Careful preparation is made in advance for the uprooting, bundling and transportation of the seedlings. A small bamboo shelter, thatched with leaves or straw, is often built to protect the bundled seedlings and the bundler from the hot sun. Thin bamboo strips are cut for tying the bundles.

In order to protect the rice stalks, whose root system is partially broken off when uprooted, transplanting is usually carried on in the afternoon and early evening before dark. If the stalks were transplanted during the hottest part of the day—between 10 A.M. and 3 P.M.—they would wilt, be severely damaged, or even die. Moreover, persons planting the rice bend over nearly double. During the middle of the day, the sun's rays come down on them almost at right angles. The heat is less intense and the glare from reflected sunlight is also less in the late afternoon.

Only the most experienced persons, usually the older women, uproot the plants. Several seedlings are pulled up at one time with the arm moving in an arc. The roots of the plant may be hit against the foot and/or washed to remove all the dirt which otherwise would hasten evaporation, make the bundles too heavy, and interfere with replanting. Leaves may be cut back in order to reduce the amount of transpiration and make the plants more uniform. After several hundred stalks have been uprooted, they are placed, roots down, on a stand and tied into a bundle. These are then placed upright on the ground with the roots in the water. Later, after being carried to the field, they are again placed in the water, and the stalks are kept moist by sprinkling.

The means of transporting the plants to the fields vary in different parts of the country. The bundles may be threaded on a long bamboo pole; placed in baskets at each end of a "carrying pole"; floated down deep ditches; carried in boats; pulled on earthern sleds and even stacked in buses and trucks. Sometimes a combination of these methods is used before the plants reach the fields.

If more than one person is planting, the workers form a line. They take a bunch of stalks in one hand and select two, three or four with the other hand and push them down in the mud. The workers move backward as they plant. Generally the larger the number of stalks planted in one hill, the farther the hills are apart. Although the ground is not cultivated between these rows, this checkerboard pattern facilitates weeding.

The operator decides how many stalks should go into a hill and the width of the space between the hills. These are not easy decisions because so many variables are involved. Operators know the fertility of their soils. They know when the rains usually come and the amount of water they can generally rely on from irrigation. However, they know, too, that the amount of rain and irrigation water varies greatly from year to year. Consequently, if they are too conservative, they may lose an opportunity for a large crop. If they are too optimistic and put too many plants in a hill and place the hills too close together, then the rains may be light and the yields greatly reduced. In addition, operators must decide what maturing varieties of rice should be planted and whether the fields should be planted or left fallow.[10] After the field is planted, a few extra seedling are heeled in some corner to be used later in re-

[10] In areas where such major decisions must be made and where so much depends upon the whims of nature, should one be surprised to find the "Mother Earth God" respected; Spirit Houses in the compounds; and Buddhas in wats cast in the position of asking for rain?

placing plants which die.

In rice cultivation, transplanting is the hardest and most exhausting work. It is always monotonous, back-straining, wet and sloppy. The task goes on rain or shine. The planters may get drenched in a tropical downpour one hour and feel the almost blistering heat the next. Clothes also get wet from body moisture because of the high humidity in the growing season. The skin on the hands, forearms, feet and lower legs wrinkles from long hours of exposure to mud and water, and often leeches cling to the planters' limbs. In spite of all these inconveniences, if a large crew works together, there are often humor and pranks to help break the monotony.

After the transplanting, the fields are kept well supplied with water, if this is possible. If the rains should stop, the water in the fields and smaller ditches dries up; the earth cracks open; and the rice stalks start to turn yellow. If it does not rain soon again, the yield is reduced and all the plants may die.

In some instances, farmers drain their fields in order to fight an invasion of land crabs. This draining permits the rice stalks to harden and pass the tender stage when crabs are most liable to attack.

Broadcasting

The broadcasting method is used for two types of wetland rice—floating rice and ordinary garden rice.

Floating rice. In the commercialized agricultural areas of the Bangkok delta plain, large areas of rice grow in deep water. Here sprouted seeds are broadcast. The young stalks of floating rice are too long, brittle and too fragile to be uprooted.

Many steps in broadcast planting are the same as those in transplanting. The fields are prepared in about the same way, but they require less plowing and harrowing. The rice seeds are sprouted, but they are sown directly on the field rather than in a nursery bed. After puddling the soil, the sediment and other foreign matter in the water is given time to settle. Otherwise the suspended material might settle down on the young seedlings and cut them off from sunlight. If this should happen, the sprouts would rot.

Timing in the planting is all important. It is best to broadcast the sprouts in shallow water (about two feet is a maximum). When the sprouts send up stalks, the upper part must remain above the surface of the water to secure oxygen. If the rains come at the usual time, mid-May, broadcasting must be completed by June or July. If not sown by then, the water may become so deep that the fields cannot be planted or the water may rise faster than the stalks can grow causing the plants to drown. The plants must be well established before their stalks start growing several inches a day to keep ahead of the rising water.

Garden rice. The oxygen factor limits the amount of land which can be sown to garden rice. The water must contain enough oxygen to supply the young sprouts until they reach the surface of the water. This may require several days. The processes of preparing the fields, sprouting, and broadcasting the seed are the same for both types of wetland rice. The primary difference is that garden rice can only be sown in fields watered by large rivers or canals (water that has a high oxygen content), or in fields where the rain and irrigation water is frequently changed or moved in such a way to add oxygen. The young sprouts need sunlight; they must not be smothered in mud or by stagnant or salty water. Moreover, the plants sown by the broadcast method develop an extensive root system near the surface of the soil. This system requires greater amounts of oxygen because not as much air has been worked into the soil by puddling.

Sometimes garden rice is sown broad-

cast directly on the ground without sprouting the seed. (About 65 to 100 pounds of rice is sown per acre.) The seeds are covered by cross-plowing. The advantages and limitations of this method depend on the amount and distribution of rainfall and the texture of the soil. Covering the seeds by plowing protects them from birds and rats. The young sprouts are also protected from the drying effect of direct sunlight and strong winds. The seedlings become anchored in the soil from the start, and the plants do not suffer much during short droughts nor do they lodge so easily at maturity. This method is used widely in Northeast Thailand.

However, covering broadcast unsprouted seeds by cross-plowing can be disastrous. If the rains are too heavy and come too soon after plowing, several things may happen. (1) The lumps of plowed soil may be completely broken down and the seeds may be buried too deeply. (2) A crust may form and keep the sprouts from pushing their way to the surface after germination. Or, the opposite extreme may take place. It may not rain for 15 or 20 days after the plowing, and, consequently, (1) the seeds may rot; (2) not enough seeds may sprout or reach the surface; and (3) the stand may be so thin that reseeding is necessary.

The texture of the soil is an important factor in limiting the use of cross-plowing. The soil should be well floccuated and should break up into large pieces. If the soil contains too much sand and is too friable, a small amount of rain will cause the particles to break down and smother the seeds. If the soil is poorly drained, and too wet and sticky, it is best not to cover the seeds.

Transplanting vs Broadcasting

Technically, the transplanting method is simpler than broadcasting. It involves less risk of loss of rice seed, time, and perhaps a crop. The transplant method requires more labor, time and back-bending work. It is believed that the economic unit of a farm family in areas where commercial rice is grown by transplanting is from 7.5 to 10 acres, whereas a farm to be as productive by the broadcasting method of planting should contain double the acreage.

Where physical conditions do not permit broadcasting, transplanting is a necessity. Although flood, delta, and coastal plains may appear level, comparatively small topographic variations help create habitat differences which are significant in land use. Transplanting is superior to the broadcasting method in the following physical habitats: (1) in depressions or on land too level to have adequate drainage and/or where the rain water tends to stagnate for long periods of time early in the growing season; (2) on soils which contain comparatively large quantities of soluable salt, such as areas near the sea on both the deltas and the old abandoned soil-filled lagoons;[11] and on (3) level land which is too high for inundation by the annual floods and too far from the rivers or canals for irrigation. In this last habitat the rice has to depend primarily on rainfall but may receive some water from surface or subsurface drainage which originates on waste or forest land at higher levels. Broadcasting would not be desirable in the habitats just described because too much seed would be wasted; the plants would not be evenly distributed for the most efficient soil water utilization and too many seeds may sprout and too many plants die later for lack of moisture.

Between Planting and Harvesting

The tempo of farm work slows down

[11] On this type of soil, the planting must be postponed until late in the wet season because the water from the early rains is needed to dissolve and wash away the salt which has accumulated during the hot dry months. If rice were planted too soon, the high concentration of salt would kill the plants.

between planting and harvesting, but the farmers are not idle. Farmers cannot be considered seasonally unemployed during the rice growing season. Through careful management, field preparation and planting are extended over several weeks if not two months. Then the fields must be tended, preparations made for the harvest, and secondary crops, fruit trees and gardens, cared for. The growing rice must be protected from land crabs, rats, stray livestock and birds. Plants in some hills may need to be replaced. Dikes may need to be repaired, widened, and built higher. Weeds must be controlled. If the rains are too heavy, it may be necessary to cut outlets in the dikes and let the water slowly out without damaging the plants or the dikes.

Between planting and harvesting, the farmers must construct or repair the vehicles needed to transport the bundles of rice to the compound (farmyard) or field stack and the threshed grain to market. Other tools used in harvesting must be made or repaired. The granaries are constructed or cleaned and repaired. Everything is made ready for the increased work tempo of harvest time.

Harvesting and Threshing

Harvest time varies from region to region and from field to field within regions according to the time of planting and the type of maturing varieties grown. It is impractical for the farmer either to plant or to harvest all his fields at one time. In most of Thailand the harvest generally starts in late November and December at the beginning of the dry season. However, in parts of the Central Plain where the water cannot be drained from the fields until the water in the rivers falls, harvesting may take place as late as mid-February. Fortunately the farmer can rely on four very dry months for harvesting and threshing in all parts of the country except peninsular Thailand.

If the farmer can control the water in his paddy fields, about ten days or two weeks before cutting the grain he cuts off the water supply and drains the field because: (1) it is much easier for the harvesters to work on dry land; (2) there is less danger of the stalks breaking and the heads dropping into the water and spoiling; and (3) not as much care is necessary in drying the stalks nor in bundling the cut grain. In fact, if the stalks are dry enough, the cut grain will not need to be placed on the stubble of the rice plants to dry. However, if the ground is wet or the stalks are too green, the stems are scattered to dry on the stubble of the rice plants.

Most of the grain is cut several stalks at a time with the women and men working in the field together. The reaper bends over, grasps several stalks in one hand, and cuts them with a curved sickle held in the other. These sickles are about 15 inches long and have an 11-12 inch serrated-edged blade fastened to a hollow pipe-like handle. In some provinces of peninsular Thailand such as Trang, stalks of rice are cut one at a time with a homemade knife.

In the geographic regions of North Thailand and Northeast Thailand the grain is usually stacked in the fields. In the North the stacks are built in an arc and resemble an amphitheater with the threshing floor in the center. In the Northeast stacks are arranged in square or oblong shapes and are often covered by a straw- or leaf-thatched roof supported by a bamboo framework. The family lives in a small temporary shelter built near the stack for protection from the cold rather than rain. Most of the cooking is done in front of this temporary shelter. This camping near the stack and the threshing floor saves time which would otherwise be wasted going a long distance to the compound. In this way it is possible for one to guard his crop 24 hours a day. Moreover, only the grain

FIG. 2. Notice that the water level has dropped drastically and that the sides of the klong (ditch) are drying and cracking open. The trees on the horizon indicate the location of a permanent water course.

will need to be transported.

Great care is taken in cutting the grain so that none, or as few as possible of the seeds, shatter out. Cutting starts in the morning after the sun has dried the dew from the stalks. The cutters work about four hours and stop for lunch. Often they lunch in the fields in the shade of a nearby tree or bamboo clump. After a respite of about an hour, cutting goes on again until dark.

In the Central Plain Region of Thailand, various means of transportation move the sheaves to the compound. In some areas the grain is carried on bamboo sleds pulled by buffaloes or these sleds are used to move the sheaves to the edge of a waterway where the grain is then carried by boat (Fig. 2). In some areas the sheaves are hauled in ox carts pulled by bullocks, and if the fields are dry enough and the earth will support a truck, these modern vehicles are pressed into service. In the North and the Northeast, if the trip is not too long, the sheaves are often carried on a pole to the stacks and sometimes to the compound.

The threshing floor is prepared while the grain is going through a sweat in the stack. "Going through a sweat" refers to the process whereby heat is generated by the grain itself and the heads become brittle. In the Central Plain, the threshing floor is near the center of the compound and located midway between the stacks of grain. In North Thailand the floor is within the arcs formed by the stacks. A space about 30 to 50 feet in diameter is flattened and hardened with heavy wooden mallets or paddles. In some places these floors are plastered with buffalo dung, and in others the floor is covered with large closely woven, split-bamboo mats.[12]

After the grain goes "through the sweat" threshing starts. In the North, the Northeast and peninsular Thailand, the grain is beaten from the heads. The thresher takes the bundle in his hands or wraps a thong fastened to two sticks around the bundle and hits the heads against: (1) the sides of large bamboo baskets or boxes; (2) split bamboo mats held vertically by stakes; or (3) over planks or on mats placed on the threshing floors. The "thong and hand sticks" enable the worker to hit the short-stemmed sheaves against the planks or mats without bending over so far.

In the Central Plain Region, animals are used for threshing. Men and women working together take the bundles from the stack, cut the bamboo strings and scatter the grain to a depth of about a foot (Fig. 3). Then three or four buffaloes or bullocks, harnessed together side by side, are driven round and round (Fig. 4). When the grain is separated from the straw, the straw is stacked around a bamboo pole (Fig. 4). The grain and chaff is piled to one side. Then more bundles of grain are cut and scattered on the floor, and the process is repeated.

Winnowing practices do not vary much in Thailand. The grain and chaff are tossed into the air with flat wooden shovels resembling long-handled paddles or with large bamboo trays (Fig. 5). If there

[12] Sometimes a post is placed in the center of the floor on which offerings to "Mother Earth" may be hung. In other places small banners are placed on the stacks of bundled grain in respect to the spirits of the harvest.

FIG. 3. A bamboo rake rests against the oblong stack of sheaves. Using a bamboo pitchfork, a man throws the sheaves onto the threshing floor.

is little or no wind, large round bamboo fans about 18 inches in diameter with short foot-long handles are used to set up an air current. In the Bangkok delta plain the more prosperous farmers have hand-operated winnowing machines; however farmers with this mechanized device are the exception rather than the rule (Fig. 6).

After the winnowing, the grain is stored or taken to market. The rice threshed in the fields is taken to the compound in baskets on carrying poles, in wooden boxes on carts, or in huge, tightly-woven split-bamboo beds placed on ox carts.

In the subsistence rice producing areas, nearly all the grain is stored for food and the next year's planting. The more

FIG. 4. Notice the stack's cone shape. The ladder, long-handled pitchfork and stake at the center of the straw stack are made of bamboo.

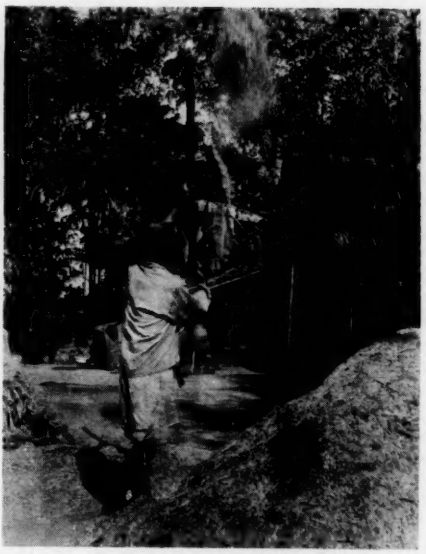

FIG. 5. Hand tools are more common than machines in Thailand. Much of the grain is still winnowed in the same way it was done centuries ago. Many compounds are lined with bamboo clumps and "rain trees." Note the farm and household utensils under the lean-to of the house.

FIG. 6. The winnowing machine, the iron shovel head, the clothing and the artistic split bamboo basket indicate a prosperous family.

FIG. 7. Grain is carried up the gentle incline of the log rather than up the steep ladder (Courtesy of FAO Office, Krung Thep).

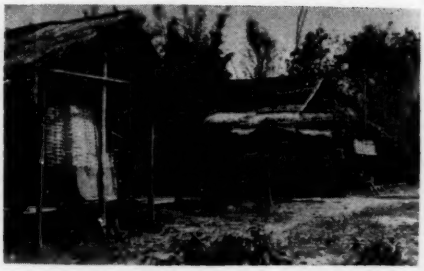

FIG. 8. A humble farmstead. The granary made of split bamboo rests on bamboo poles. Both the granary and the house to the right are thatched with yaka grass (Photo by Robert L. Pendleton).

prosperous farmers have large oblong granaries made of solid wood and divided into several bins. These granaries have long eaves extending over the sides; are set on teak pillars about six feet above the ground; and have clay tile roofs (Fig. 7). These are the most weather proof, fireproof and vermin-proof of all the granaries in Thailand. Other granaries are made of woven split bamboo and plastered with mud and/or buffalo dung and thatched with leaves or straw. These granaries are: (1) more or less cylindrical or cone-shaped; (2) built on a platform set on stilts; and (3) are covered with a roof which may be a lean-to fastened to one side of the house (Fig. 8).

In the commercial rice producing areas, the grain is rushed to market almost directly from the threshing floor (Fig. 9).

Summary

Growing rice in Thailand involves hard work, technical know-how, keen evaluation of the natural environment, and action based on practical guesswork. The biggest conservation problem facing the country is a more efficient use of land and water. After the crop is threshed, the Thai have time to relax, and many of their holidays and festive traditions are observed in the dry season.

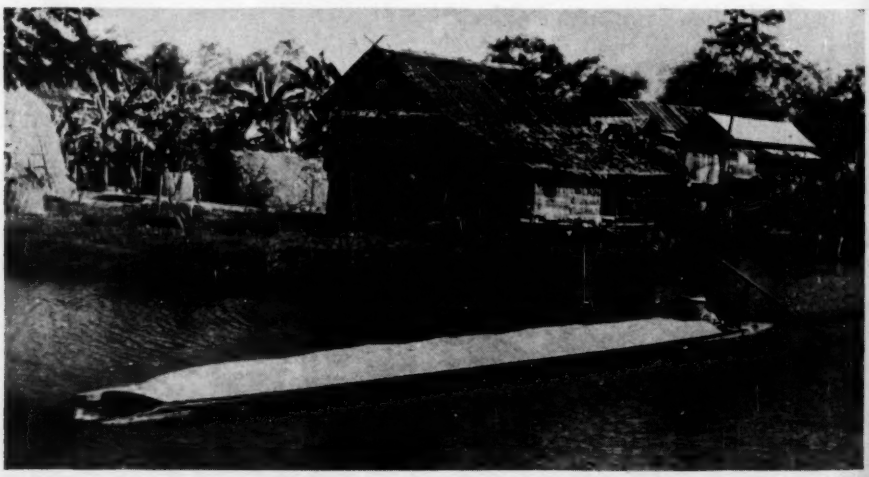

FIG. 9. Rushing the grain to market in small klong boat. A typical farm scene along a large klong (Courtesy of W. J. van der Oond, ECAFE, Krung Thep).

THE CHANGING DIMENSIONS OF THE WORLD COMMUNITY*

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University of Chicago

A COMMONLY HEARD observation during the five decades since the American high school assumed its present form is that the world is getting smaller. Another is that the world is getting more complex. Still another is that the physical world has changed little, while societies have changed radically.

From the fact and myth that are compounded in these statements we can suggest some of the basic changes that are taking place in the dimensions of the world community. These changes promise to continue at an accelerated rate. And that prospect, in view of the apparent state of teaching about them, is one of which our high-school students may be unaware.

Knowledge Available to Students in a Shrinking World

Without doubt the earth is getting smaller in terms of travel time. In 1900 only parts of the United States and Canada were accessible from Chicago in three days' travel by commercial passenger transport. In 1957 more than half of the urban areas of the earth are so accessible. The prospect is that this area will be expanded and that the area accessible within one day's travel will be tremendously enlarged as new aircraft and trucks come into use. We all recognize these and other technological facts and see at once their implications for a view of the world as being, in terms of transportation, a closely linked neighborhood.

During the same period the views which students develop of the world through the use of maps have become more nearly accurate. No map in two dimensions ever can faithfully represent the three-dimensional world. The literal globe remains a basic teaching device, but flat maps for showing a spherical world have improved. The Mercator projection, with its navigators' willingness to distort the area and shape in the interest of direction, has yielded place in textbooks to projections which are true in area. The equal-area view is an illuminating one, particularly when used to show the volume of population and resources concentrated in any area. In some books an equal-area map of population has replaced the traditional Mercator map of political units.

Orientation of maps also is changing. The United Nations has graphically suggested that North America may not be the center for all purposes. The International Geophysical Year has reminded us that 90° latitude may be a pole of interest as well as the limit of "our" hemisphere. One has only to examine the textbooks of other populous continents to recognize the ethnocentrism of much of our map-teaching.

On the whole, cartographic representation has improved tremendously. It is more balanced, accurate, and unbiased than it was five decades ago. And the day may not be far off when every American railroad company will have the courage to publish a timetable map in which its line is not shown as the shortest available route between two points.

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Students' Needs for New Ways of Thinking about Geographic Relations

One might hope that, with the dramatically contracting transport times and with increasingly accurate representations of the world, the high-school graduate would emerge sensitive to the character of the world which now is at his doorstep. The contrary appears to be the case.

Benjamin Fine several years ago made it painfully clear that the American college student, while entirely capable of making seasonal migrations across the Atlantic on a shoestring, is quite unaware of simple facts of location.[1] Fine showed, you may recall, that there was fuzziness about major locations in the United States and rank ignorance about overseas areas. Perhaps the perfect but sad example of this illiteracy was cited by Jesse H. Wheeler, who found at the peak of the Korean War that 46 per cent of a representative group of university students did not know the whereabouts of Korea.[2] If any of you have any doubt about this, ask a group of high-school graduates to enter on an outline map of the world the places named on the front page of a large metropolitan newspaper for that day.

Having noted this deficiency, I shall maintain that it is not in itself important. Any reasonably intelligent person can go to an atlas and find Algeria, Little Rock, or Moscow. May all the map-publishers preserve us from teaching, as some textbooks did in the early part of the century, the countries that bounded Austria and the capitals of the states! That is no more modern-day geography than rote recital of grammatical rules is literature.

[1] Benjamin Fine, "U. S. College Students Flunk in Knowledge of Geography," *Journal of Geography*, L (November, 1951), 334-41.

[2] Jesse H. Wheeler, Jr., "The Role of Geography in General Education," in *A Half-Century of Geography—What Next?*, University of Chicago, Chicago, 1955, 25-34.

I do maintain, however, that this illiteracy as to place is symptomatic of a truly alarming ignorance about spatial relations and ways of thinking about them. Two common attitudes which I have observed among American high-school graduates illustrate the point. One is the attitude that all foreign areas are uniform in character within their boundaries and are much alike, one to another. This is perhaps forgivable in a country where slang, gasoline stations, malted milks, and textbooks are nearly the same from coast to coast. It encourages easy and unwarranted generalizations about other parts of the world. Indeed the tacit response to a question about Indonesia, Iraq, and Iran is that probably all are much the same wherever they are and that it doesn't make too much difference where they are because they are all much the same.

A second attitude is that man has done a good job of conquering nature for his own benefit in the United States and that, if other peoples had enough energy and know-how to turn to and handle their own resources similarly, the obstacles to improving human welfare would be largely removed. The United States, it is true, has had as many natural resources per capita as any other major nation except perhaps Canada. The United States is using up its resources at a higher rate than any other nation. This present circumstance makes it difficult to recognize the combinations of factors that in fact impede or foster economic growth in other countries and that attach to the earth's capacity to support its growing population. It also impedes the understanding of the impending necessity to husband resources more carefully both at home and abroad. Technology is in fact changing the face, as well as the space, of the earth. Since 1900 the vegetable cover has been destroyed or modified over large areas, the courses and flows of rivers have been changed radically, mineral de-

posits have been exhausted, and urban settlement has stretched out and coalesced over the rural landscape at a rapid rate.[3] But it is gravely misleading to believe that conditions for applying technology are everywhere the same or everywhere favorable. Man the conqueror must also be seen as man the cautious adjuster and man the destroyer.

If students are to be expected to deal intelligently with the perplexing and frustrating diversity of the world of which they are a part, they will need to be given a clear view of its true dimensions. Among these dimensions I will suggest only two that cry out for literate understanding at the high-school level. One is the dimension of areal organization. The other is the dimension of capacity to support population.

By "areal organization" I mean the arrangement of various social functions on the earth's surface. For example, each small town serves as the focus for retail trade in the surrounding area. In similar fashion a larger town may be the center for religious organizations in its area. We may recognize the world's surface as covered with an intricate network of such activities—some related, some independent of others—arranged in various hierarchies of concentration. In the Chicago region, distinct hierarchies of urban places are familiar to us, and similar arrangements may be found elsewhere.[4] The shifts that are taking place seem to be in the direction of greater concentration and complexity. Whole zones of primitive agriculture, which were largely independent in their functional organization in 1900, are now linked by movements of goods, people, and ideas to the rest of the world. The whole political organization is increasingly complex, not only through the increase in number of political units, but through the increase in the international functions. The area with which any one group of people has functional relations has been immensely expanded. Students need a framework of thought in which these multiplying contacts and relations of this expanding world may find a meaningful place.

Areas of the earth differ from one another in their capacity to support people as well as in their relations to one another (Fig. 1). Probably much of the public discussion of the dangers of overpopulation has been emotional and distorted, but the underlying situation which it reflects is profoundly serious. At least four hard facts stand out and cannot be ignored. (1) World population is exploding at an increasing rate. (2) In some areas, such as the uplands of Latin America and the grazing lands of the Eastern Mediterranean, resource destruction is accelerating. (3) While technology has brought greater productivity and halted resource destruction in certain areas, its rate of acceptance is so slow in other high-density areas, such as India, that it barely keeps up with population growth. (4) The present relation of population to resources in some areas is such that, although increases in the level of living may be expected, the differential between the level in those areas and the level in the United States probably will increase rather than decrease.

To the dilemma of rising population and fixed resources, many solutions, ranging from resource development through population control, suggest themselves. The dilemma is not insoluble. Most of the solutions assume widespread improvement in education affecting technical skills, marketing, family organization, and social goals. Even if we assume a magnificent deployment of educational effort for these purposes across the earth, there remains for us in the United States

[3] These changes are reviewed in William L. Thomas, Jr. (ed.), *Man's Role in Changing the Face of the Earth*, University of Chicago Press, Chicago, 1956.

[4] Allen K. Philbrick, "Principles of Areal Functional Organization in Regional Human Geography," *Economic Geography*, XXXIII (October, 1957), 299-336.

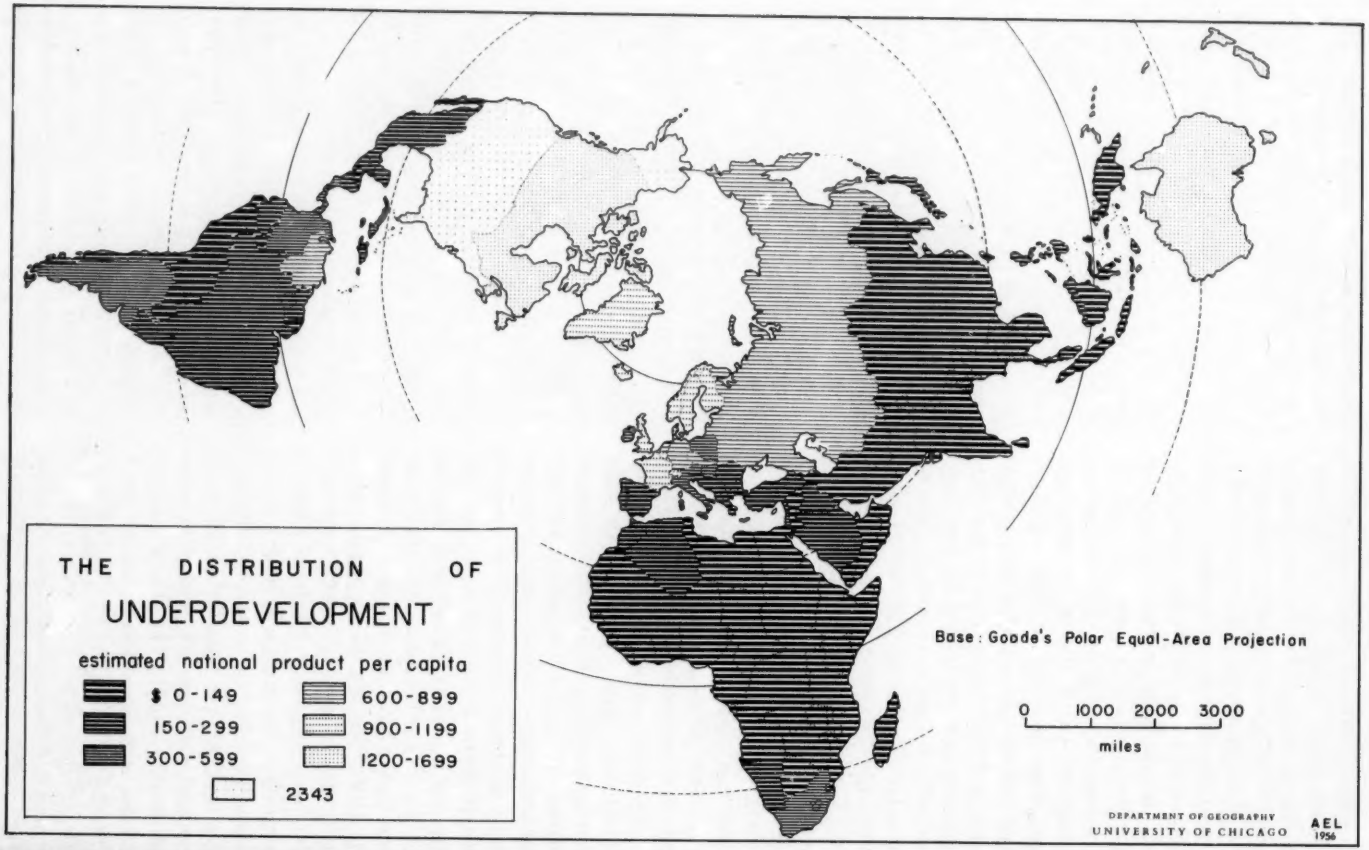
THE DISTRIBUTION OF
UNDERDEVELOPMENT
estimated national product per capita
$ 0-149
150-299
300-599
600-899
900-1199
1200-1699
2343
Base: Goode's Polar Equal-Area Projection
0 1000 2000 3000
miles
DEPARTMENT OF GEOGRAPHY
UNIVERSITY OF CHICAGO
AEL
1956

FIG. 1

and in a few other countries a challenge of a very special sort. How do we prepare our young people to take their places in a world in which large numbers in other countries are struggling for economic and cultural survival, while our own country progressively widens the economic gap between itself and the others?

Let me sum up my argument thus far. The world into which the next generation of high-school students will move seems likely to be one that will have more intense and complex confrontation of cultures than ours; that will struggle with a more severe pressure of population upon physical resources; and that will maintain, and even deepen, over a long time the present inequalities in levels of living. While the dimensions of time in the movement of ideas and men and goods continue to shrink, the dimensions of organization promise to expand.

Understanding these changing dimensions thus will be a more difficult task than it is now. Clearly it is a far more important one. We may hope for students who will see the world, in its areal differences and similarities, with perspective and sensitivity and who will have begun to think about the reasons for these patterns.

Ways of Cultivating Understanding

Just as we have only begun to view education as a comparative study, recognizing the strengths and weaknesses of different methods to serve differing aims of societies, we have only begun to explore ways of cultivating understanding of the world's dimensions. Literature and history, natural science and geography—all offer opportunities largely unexplored. What are the effective ways of teaching critical respect for the literatures of other cultures without sacrificing our own tradition? What are the means of developing an appreciation of our own short history in relation to the broad panorama of world history? How can the science studies aid in seeing the possibilities and frustrations of adjusting resource use to multiplying human needs? What are the fruitful means of teaching the geography of the changing earth?

Many partial answers are already at hand. To assess our experience to date with these efforts and to explore the challenges ahead, it may help to offer one general observation and to illustrate the observation with one concrete venture in teaching.

An apparent dilemma arising in any effort to sharpen understanding of world dimensions is that covering the earth in our teaching is at the cost of superficiality. If the United States becomes conscious of a politically emergent Africa, the tendency is to call for a unit on Africa somewhere among the social studies or to include a few Bantu legends in a book of graded readings. Such a response is attractive because it is direct and relatively easy, but, taken alone, it is distressing. The addition of new subject matter is hopeless in terms of its rapidly growing volume, and it is likely to be confusing. The solution does not lie in the direction of more units of study covering more parts of the world or more of its interrelated aspects. It lies in focusing upon a few of the basic modes of thought that will help in illuminating the new and continually changing facts about the world.

For example, one of the elementary ideas in geography is that of regional association of phenomena on the earth's surface—the recognition that the distributions of climate, soils, vegetation, minerals and population occur in distinctive combinations and that a change in one element in the complex may bring profound changes in the others.[5] This con-

[5] For a clear review of basic geographic ideas, see Edith Putnam Parker, "Developing the Sci-

cept, if understood by the student, helps him to see related physical phenomena in a unified framework. Perhaps more important, it helps him to recognize that any familiar or new part of the earth has its own distinctive combination and is likely to respond in its own unique way to changes. So-called underdeveloped countries are then seen to be radically different from one another in their conditions of economic growth and in their response to new technology or social organization. With this idea the student begins to recognize that meeting the world's food needs is not a simple matter of generously spreading American know-how wherever it is lacking. And he is prepared to find that a spread in democratic forms of government will not necessarily prevent a deterioration in a country's soil resources. This concept of regional association of phenomena can be taught in high schools. It requires preliminary work on more elementary ideas of earth features. Once mastered for one area, the concept becomes applicable to any area, and students no longer can regard a little-known region as being as uniform as the color shading on a political map.

The teaching of such a concept at the high-school level may well begin in the school's back yard with local complexes and be carried far enough afield to show its meaning for distant places. Thus, in an experimental course recently tried at the University of Chicago High School the work in geography began with the port of Chicago and the functions it performs for the city and for faraway places. It asks what will be the effect of the opening of the St. Lawrence Seaway in 1959 upon those services and upon the life of the city and of neighboring areas. In that fashion the student builds upon elementary ideas of space and resources to appraise one area and to see it in relation to other areas near and far.

This kind of thinking is encouraged in some social studies and in geography. I have the impression that it fares less well in the combined social studies and that the tendency is for students to emerge from such studies with a certain familiarity with social problems rather than with a discipline of thinking about them. Both historical and geographical modes of thought seem to have lost precision and strength from being merged in the broader approach of social studies.[6] There are distinct and refined teaching techniques that apply to geographical ideas alone, and some are being lost rather than refined.[7]

Challenge to the School

In our earnest concern to prepare young people to live in an increasingly complex world, we are in danger of trying to teach them so many facts about the world as it was last year that we shall teach them little of the ways of thinking about the world that is becoming. The challenges that lie ahead in the changing dimensions of the world community are to fit people to think about the immense diversity of that spatially contracting community and to recognize the sobering inequality of conditions that figure in our united efforts to advance the welfare of its two and a half billion members.

ence of Teaching Geography," *The Teaching of Geography* (Thirty-second Yearbook of the National Study of Education), University of Chicago Press, Chicago, 1933, 73-177.

[6] C. F. Kohn (ed.), *Geographic Approaches to Social Education* (Nineteenth Yearbook of the National Council for the Social Studies, Prepared with the cooperation of the National Council of Geography Teachers, Association of American Geographers, American Society for Professional Geographers), National Council for the Social Studies, Washington, 1948.

[7] See (a) Edith Putman Parker, op. cit.; (b) Joe Russell Whitaker, *Geography in School and College: Talks on Values and Problems*, George Peabody College for Teachers, Nashville, 1948.

TEMPERATURE CHANGES IN NORTHEASTERN UNITED STATES, 1906-1955

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IN AN ATTEMPT to determine how much change there has been in temperature since the early part of this century, detailed temperature statistics were compiled for the chief weather stations from which continuous records are available.[1] The area embracing Northeastern United States in this study is bounded on the west by the right-bank cities of the Mississippi River, plus Duluth, and on the south by the southern borders of Kentucky and Virginia (Fig. 1).

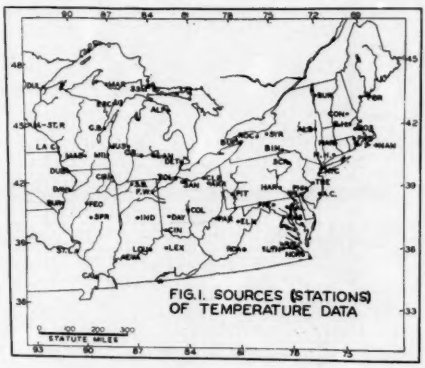

FIG. 1

Since, in some respects, annual temperatures alone may not represent as true a situation as do averages that spread over a number of years, ten-year running (or moving) averages have been used in most of this study (except where stated otherwise near the end of the paper). On the basis of these ten-year running and, thus, overlapping averages, as for example those covering the years 1906 through 1915, 1907 through 1916, and so on, 54 stations have been composited to indicate the overall change of temperature throughout the entire area involved. Figure 2 shows the change on this basis. The graph thus represents the changes of temperature from 1906 through 1955 in Northeastern United States. Each vertical line represents one decade; each horizontal line represents one-tenth (0.1) degree Fahrenheit. The temperutare change was upward, in general, to the decade of maximum temperatures, which was 1930-1939. Since that decade there has been a tendency toward a somewhat more uniform temperature which is noticeably higher than in the first part of the century but not as high as the peak decade. The composite running decadal range of temperature, that is, the peak decade minus the minimum decade for all 54 stations, was 1.59°F. The minimum decade was 1909-1918.

Sixty-seven stations were used for the purpose of determining individual changes. All but three of these stations fell into two groups: those that attained their maximum temperatures in the 1930's and those that attained their maxima in the decades of the mid-forties

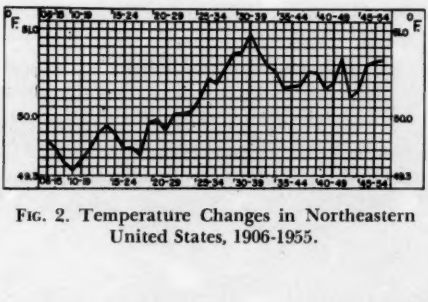

FIG. 2. Temperature Changes in Northeastern United States, 1906-1955.

[1] The data were compiled from the United States Weather Bureau publication *Local Climatological Data, 1955*. A separate summary is available for each of the stations. Numerous other statistics, such as precipitation, snow, winds, degree days, sunshine, and normals, means, and extremes, plus a narrative for the stations, are included. The majority of the stations are now located at airports.

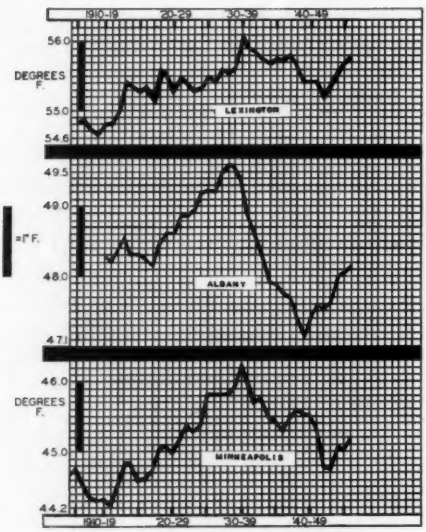

FIG. 3. Stations reaching maximum temperatures in the 1930's.

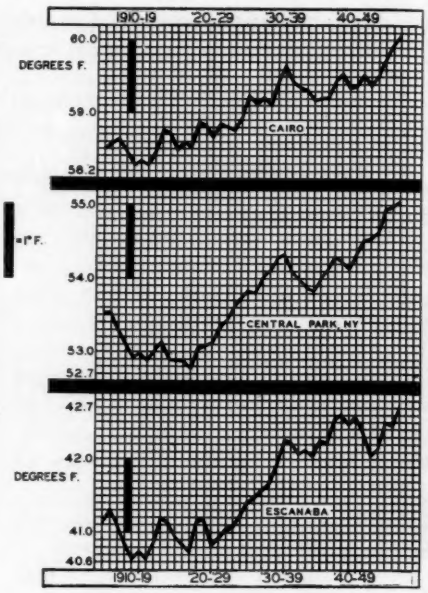

FIG. 4. Stations reaching maximum temperatures in mid-40's to mid-50's.

to mid-fifties. Of the total 67 stations, thirty-seven, or 55 per cent, reached their maximum temperatures in the 1930's. In turn, 84 per cent of those 37 attained maxima in the single decade of 1930-1939, which means that the single decade of 1930-1939 was the warmest decade at 46 per cent of the first-line stations of Northeastern United States.[2] Representative of these stations are Albany, Lexington, Kentucky, and Minneapolis-St. Paul, as shown in Fig. 3.

As previously stated, the second period of maximum temperatures occurred in the decades of the mid-forties to mid-fifties. Twenty-seven stations were in this category. Three representatives, Cairo, Illinois, Central Park Station of New York City, and Escanaba, Michigan, are shown in Fig. 4.

Thus there were two distinct periods of maximum temperatures in the time involved. The first occurred during 1930-1939 and the second lasted from the mid-forties through the mid-fifties. It is interesting to note that 79 per cent of the stations reached their highest temperatures in the two single decades of 1930-1939 and 1946-1955, the last year of record in this study.

Only three stations of Northeastern United States deviated from the two maximum temperature periods. Wilmington, Delaware, reached its maximum decade in 1912 to 1921; Roanoke, Virginia, in 1925-1934; and Duluth in 1940-1949.

The map (Fig. 5) differentiates the parts of Northeastern United States that reached their maximum decades in the thirties, the mid-forties to mid-fifties, and at miscellaneous times. It will be seen that most of Wisconsin, Illinois, Indiana, and Kentucky had their warmest decades in the 1930's. Two discrete areas in east-

[2] Certain stations of Northeastern United States were deleted in this study because either their records did not go back far enough to give a comparative appraisal or because their data were incomplete.

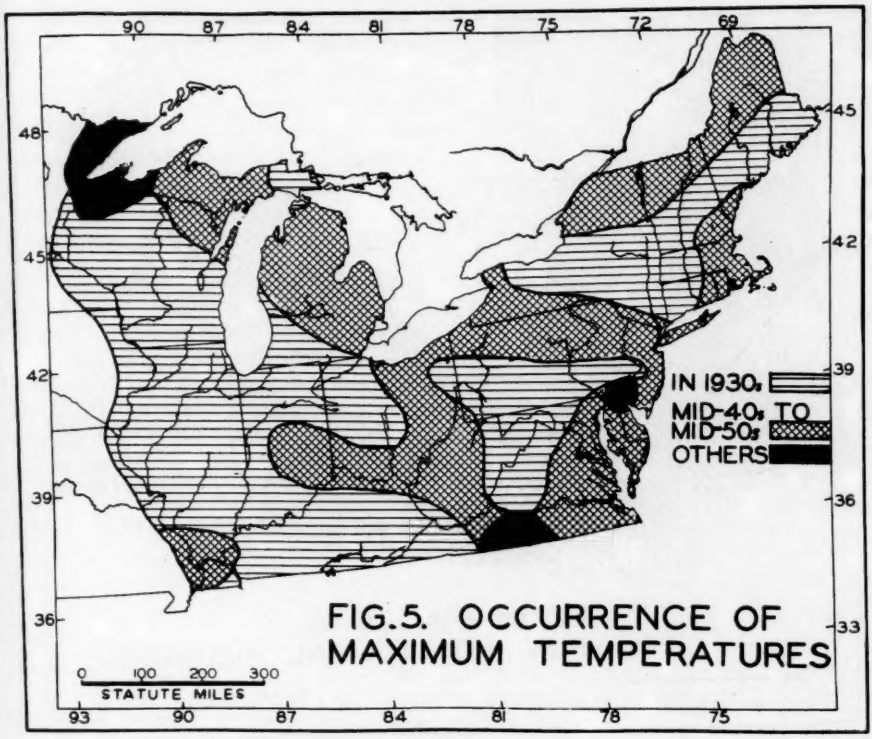

FIG. 5

ern United States followed the same pattern. Most of the Atlantic Seaboard, on the other hand, plus an extension northwestward to the upper peninsula of Michigan and southward from Lake Erie, reached maximum decades in the mid-forties to mid-fifties. Although there were more stations with their maxima in the 1930's than in the mid-forties to mid-fifties, the areal extent of the former was not much greater than that of the latter. Duluth, Roanoke, and Wilmington appear as solid-colored areas.

Still, on a decadal basis, not all stations had their lowest temperatures in the early part of the period of concern. This was especially true of those that reached their peaks in the 1930's. In this category, 12 cities reached minimum decades after their maxima. Albany is an example. Conversely, most of the stations having maxima in the mid-forties to mid-fifties group exhibited minima much earlier, particularly in the decades of either 1909 through 1918 or 1917 through 1926.

Figure 6 indicates the ranges of running decadal averages, that is, the difference between the minimum and the maximum decades. The distributional pattern is rather complex, partly because stations in close proximity sometimes had considerable differences. The range at Toledo was 1.43 degrees while nearby Sandusky had a range of 2.47 degrees. Similarly, Davenports range of 2.12 degrees contrasts with Burlington's of 3.21 degrees. Only Elkins, West Virginia,

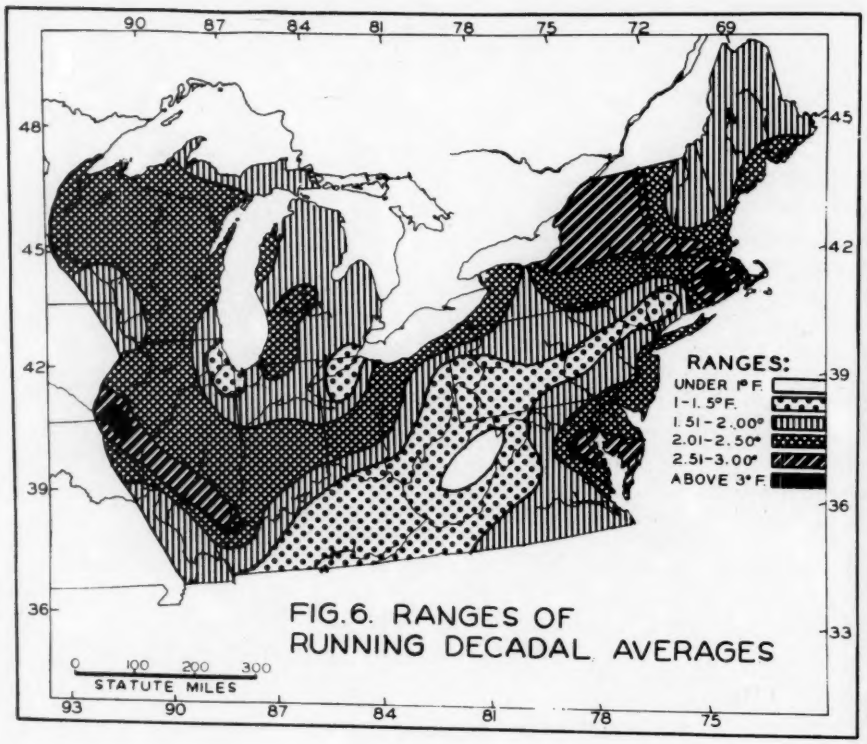

FIG. 6

had a range of less than one degree (0.80°), while Burlington, Iowa, had the greatest range (3.21°). A breakdown of ranges shows that 13 stations had ranges of less than 1.50°; 20 had ranges from 1.51° to 2°; 26 had ranges from 2.01° to 2.50°; 5 had ranges of 2.51° to 3°; while only Providence and Burlington, Iowa, exceeded 3°.

Using simple mean annual temperatures by way of contrast to decadal figures, a composite graph, Fig. 7, shows a highly irregular pattern. On this basis, the coldest single year was 1917, the warmest year 1931, and the second warmest 1921. The range of these figures is 6.4°. There was a high station correlation from year to year. Thus, when the graph indicates a rise or fall of temperature, most of the individual stations followed suit. For example, in 1917, every station dropped from its 1916 figure; in 1921, every station rose above its 1920 figure; while in 1937, a year of more modest change, all but five stations dropped.

The graph indicates that mean annual temperatures fluctuated less in the second half of the period than in the first half. It also becomes evident that both the maximum years and the minimum years in the fluctuations show a change toward higher temperatures. This is indicated by the two straight lines that angle upward from the left to the right side of Fig. 7. While an upward *trend* may be suggested in the figure and also to some extent in Fig. 2, which was the composite graph on a decadal basis, mathematically the length of time may

be insufficient to support such a claim at least on a long-term basis. Hence, the simple term *change*, rather than *trend*, has been used in this paper. Some climatologists recognize changes of only a few years as constituting short-term trends.

Factors causing the changes of temperature were not studied exhaustively and neither generalized nor specific reasons for the changes are advanced at this point. The study, so far, has been chiefly statistical. But the belief is, in spite of certain known weaknesses in using figures from a large and varied area and where station locations have frequently been changed from the city to the airport, that the data here presented give a reasonably reliable temperature picture, within a small margin of error.

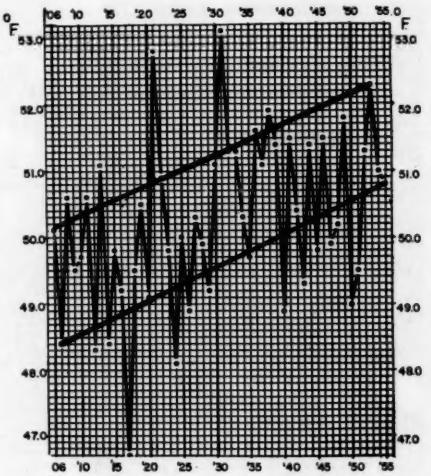

FIG. 7. Composite of the mean annual temperatures for 54 stations, 1906-1955.

THE EAST INDIAN IN TRINIDAD—A STUDY OF AN IMMIGRANT COMMUNITY

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Trenton State College

SLAVERY had ended in European colonial possessions: the nefarious 'Black Traffic' had ceased and the development of tropical areas had a temporary setback in the first half of the nineteenth century. Britain's interest, however, in her tropical colonies was not to be abandoned. Her sovereignty over her vast Indian Empire gave her unlimited authority over India's poverty-stricken millions.

The Indian peasant was inured to tropical conditions to a degree unknown in other civilized regions within an intertropical belt. He was intelligent, submissive through centuries of social and political oppression, emaciated and lacking in stamina from the hardships of a peasant economy, and resistant to tropical heat and diseases because of his Indian origin.

As a member of a migrant community, the East Indian is to be found in Malaya, Fiji, Mauritius, Natal, British East Africa, Trinidad, and British Guiana. In almost all these possessions of Britain, the Indian entered in the role of a laborer. His white overlords recognized in him the qualities required for the development of tropical agriculture. The Indian was recruited for the sugar industry. Sugar production was an Indian industry, for the sugar cane was tended, nurtured and cultivated on Indian soil. A survey of Indian labor abroad would reveal that the Indian is associated with sugar cane as in India, or with tea as in Ceylon or with rubber as in Malaya.

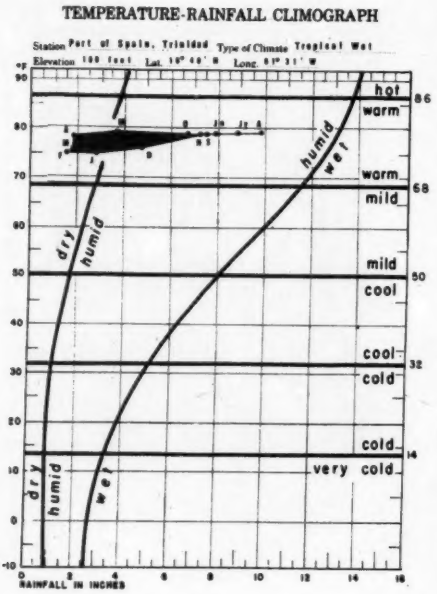

FIG. 1

Cotton and tobacco, as examples of tropical crops, did not engage the labor of the Indian abroad.

In this brief paper it is my purpose to highlight the role of the East Indian in the island of Trinidad (Fig. 1). His compatriots are to be found in British Guiana, Surinam, and the Antilles. In Caribbean possessions outside of Britain's influence, the Indian did not enter as a laborer. Offshoots of Indian immigrants entered the islands for economic opportunities. Statistics on the number of Indians in all of the Antilles are not available. The East Indian is absorbed in the complex population and is not identified according to his racial origin. In Jamaica one is a Jamaican, in Puerto Rico, a Puerto-Rican. West Indians resent the division of the islanders on ethnic grounds.

Physical Environment

The island of Trinidad, a setting for the immigrant East Indian, has had its geography described in the many references to that island in text-books and journals, but a few environmental facts are re-stated in this paper as a basis for the understanding of the East Indian on that island.

Trinidad consists essentially of three east-west systems of elevated land separated by two belts of low to moderate relief. A rugged and deeply notched range of mountains forms the northern east-west belt of high ground, while the southern limit of the island is characterized by a mountain range of low relief.

The major agricultural development has taken place to the north and south of the central range where flat lands and swamps occur. The rich black loams of the western part of the island are ideal for sugar cane; the yellow to red clays in the sheltered interior support the cacao; the Caroni swamp, near Port-of-Spain, with its adequately drained heavy black soils, forms the extensive rice lands; and coconut flourishes in the well-drained sandy soils of the southern and eastern coasts.

In addition to beneficial soils, the island possesses a favorable climate for tropical agriculture (Fig. 2). Rainfall varies from 60 inches in the west to more than 140 inches in the eastern prominences of the northern ranges. No month of the year passes without rain, but the distinct rainy season extends from June to December. Most of the cultivated land receives between 55 inches to 90 inches of rainfall a year. Due to Trinidad's equatorial location, precipitation is in the form of heavy convectional showers of short duration but of great intensity followed by brilliant scorching sunshine. May is the hottest month with a mean temperature of 78.8 degrees and January the coldest month when the mean temperature is 75.6 degrees. The temperature range, typical of the location, is small, but the high relatively humidity

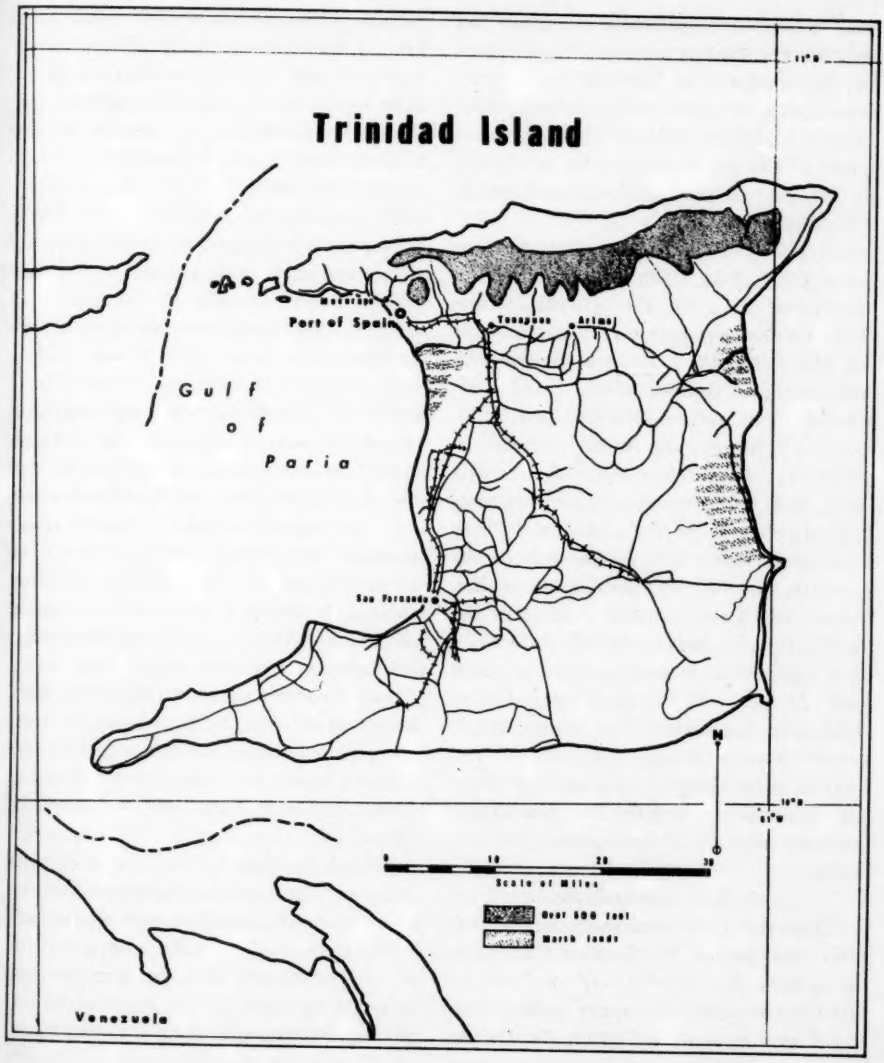

FIG. 2

favors the growth of cacao, which thrives in security from the hurricane that sidetracks Trinidad but which periodically devastates many of the islands of the West Indies. A wise early British Administration took measures to conserve the natural forests which occupy much of the sloping land of the mountains and which, in addition to providing valuable timber, act as a protection against surface run-off and dangerous soil erosion.

Racial Composition of the Island

The aborigines of the island, the Arawaks and Caribs, had long since disappeared before the arrival of the East-Indians. In the checkered history of the island, foreigners dominated the political

and social life. Spaniards occupied the island. The East Indian and Englishman formed a part of the heterogeneous group amongst which are found French, Chinese, and Negro strains. The Negro element in the population is the most striking feature in the racial composition of the inhabitants.

Of the island's total population of some 635,543 in 1950, the East Indians numbered 227,390. The growth of the East Indian population over the 50 year period (1901-1950) for which statistics are available is approximately 141,000, the result of natural increase and immigration. The sex ratio in the birth rate in 1956 was 6061 males to 5685 females, in a total of 27,447 island births for that year. The death rate for the island as a whole was 24 per thousand at the turn of the century, but by the year 1956, it had fallen to 9.6 per thousand. Malaria has been brought under control, and in the year 1956, fatal cases reported constituted only 2.6 per 100,000 of the population. Improved sanitation and water supply added further to age longevity and it may be interesting to note that the population density rose from 154 per square mile in 1901 to 380 per square mile in 1956.

Indian Immigration

The year 1945 witnessed the Centennial Celebrations of the East Indians in Trinidad. The first group of East Indians to develop the sugar industry arrived in the year 1845 from the United Provinces of India over an ocean route that passed the Cape of Good Hope. The hazards of the long ocean voyage left their imprint in the consciousness of the islanders—a factor that has contributed to the East Indian's isolation from the motherland. Even to this day the waters around the Cape of Good Hope are referred to as the "Pagla Samunder," meaning "mad sea" in Hindi. The Cape of All Storms, an appelation by which the present Cape of Good Hope was then known, was dreaded by the early navigators as it was by the bewildered East Indian in the small craft of a century ago. There was little desire to repeat the terrifying experiences of another voyage across the oceans.

The settlement of East Indian laborers in Trinidad gave an impetus to the sugar industry. The reliability of East Indian labor, the docility of the field-worker, the willingness of the East Indian to offer his labor in the field, and the low costs involved in food and housing have all been factors in promoting the rapid expansion of the sugar industry in Trinidad. The distribution of the East Indian followed those parts of the island where level lands and fertile soils were favorable for the growth of sugar cane. The western parts of the east-west trending valleys between mountains and areas characterized by lowlands bordering the sea contain East Indian farming settlements. Crude houses with thatched roofs, constructed with the fronds of the coconut tree and supported on stilts as a protection against floods, provide shelter from the scorching sun or torrential rains.

When the East Indian first arrived in Trinidad, he built his home in the likeness of the Amerindian hut of thatched roof and wooden floor supported on stilts. The Amerindian had need for such a home to protect him from menacing floods, vermin, and snakes. Even though the dangers from floods are over, the vermin controlled and the snakes destroyed, the pattern of the original home on stilts persists as is evidenced by the solid concrete buildings with iron roofs supported on brick pillars, which guarantee a sturdier home in a challenging environment. During the hot summer days the ground floor allows for a free circulation of air and is ideal for a noon-day rest. On this floor paddy rice is threshed, children

play, infants sleep in hammocks, visitors are entertained. Evenings are filled with songs and other music. The stilt-supported home with all the elaborate external ornamentation in color and carvings is the typical home of the lower income groups of East Indians. The more prosperous and the wealthy model their homes on modern designs, while the stilt-supported home of the peasant and laborer stands forlornly in the neighborhood of swamps and forest clearings.

Occupation

The East Indian urban dweller is engaged in the professions—law and medicine—teaching, commerce and sundry occupations. The rural East Indian, on the other hand, is a market gardener or a field laborer. As a market gardener, he produces the bulk of the vegetables for urban requirement. Careful and painstaking tillage under the tropic sun are not without their rewards for the patient gardener. Market gardening is a family participation: young and old, male and female work under a broiling sun raising English vegetables, as well as vegetables of Indian origin, and rice. The latter is the staple food of the East Indian and enjoys great popularity in the diet of other communities on the island. Of the fruits, the mango was imported from India as well as the jack-fruit and the Indian variety of the banana. East Indian homes are easily recognized by the presence of such trees non-indigenous to Trinidad.

Language and Culture

The widespread use of the English language in the East Indian community indicates the extent to which isolation from the motherland and the absence of cultural contacts with India have contributed to a decline in the importance of mother-country languages. The present generation of Indians are in most instances totally ignorant of Hindi, Tamil or Telegu, a situation deplored by the elders of the community who are making efforts to found part-time language classes for the children. A few pandits exercise a tremendous influence on the members of their community and it is through their unflagging interest in the cultural welfare of their people that a revival in Hindu religion and literature is in evidence on the island. Indian films and records of Indian music are quite popular in Trinidad, and it is incontestable that these are a new powerful media in arousing a strong desire to learn Hindi which is the most widely used Indian dialect on the island. In homes where Hindi is not spoken it is not surprising to find a large collection of recorded Indian music which has a strong emotional appeal to the East Indian. In vernacular schools and temple gatherings children are made to sing the sacred hymns to the accompaniment of music. This is done with much fervor and deep spiritual yearnings.

My arrival in Trinidad coincided with the 'Holi Festival', a religious celebration of North Indian Hindus and typical of the 'Sanathan' (orthodox) group. This was an unexpected experience because celebrations of this kind disappeared long ago in the Union of South Africa where Sanathans are found in large numbers. It is, nevertheless, an indication of the people's cultural ties with India and a proof of the deep-rooted religious beliefs of a transplanted people. It is profoundly expressive of the overpowering desire to identify themselves with the motherland.

For a long time many Hindus were under Christian missionary influence and the process of evangelization was rapid, notably because of the decline in the dialects and the substitution of English in the East Indian community. A recent trend is the resistance to evangelization shown in the establishment of vernacu-

lar classes, the introduction of Hindu religious instruction in schools and the rigid observance of religious festivals and temple worship. Hindu marriages are performed by Hindu rites and the rituals and ceremonies are important features of the marriage contract. Hindu brides and married women indicate their marital status by the streak of crimson (sindhur) along the hair-parting on the head. This custom, dating from the Muslim invasion of India is still rigidly observed by orthodox North Indian Hindus. A married Hindu from South India will display a crimson spot on her forehead.

The substitution of English in the home has had no effect on the names of East Indians residents in Trinidad. The use of the prefix Ram is widespread and names such Rampersadh, Ramnath, Ramgobin, Ramsingh, Ramkissoon, Ramjeowon, etc. are frequently encountered. The older generation of men still wear the 'Pagadi'—an elaborate head-gear of twisted cotton cloth.

In two respects the East Indian is clinging tenaciously to his Indian culture. One is the matter of dress, and in this respect, the East Indian woman has not abandoned the sari. The older generation of men still wear the 'Dhoti' on ceremonial occasions or when they are relaxing at home, but the young male has discarded the traditional dress in favor of the western attire. Food constitutes the other aspect of his culture, the preparation of which requires certain edible oils and condiments which the Indian has contrived to produce on the island. The Indian market gardener, therefore, produces large quantities of pulses and condiments without which the exceptional flavor of Indian foods cannot be produced. Many an East Indian has accepted the English language, accepted western dress habits, accepted Christianity, accepted the Western way of life, but he has not accepted Western food. The 'curry' dominates every other item in his culinary preparations—the 'masala' is still the indispensable ingredient.

The Outlook

The Northwestern coast of Trinidad around Port-of-Spain contains a concentrated population with a large number of East Indians. It is here that the Caroni Swamps have been reclaimed and where sugar and rice dominate the agricultural landscape. Many well-to-do East Indians own rice fields and cane plantations, but a large element of the population is employed as laborers.

The wooden cart, a home-made vehicle of mediocre skill, is to be seen on its way to the market, laden with garden produce and drawn by a donkey. On this cart is seated the Indian owner-laborer with his son or daughter beside him. The pace is slow—it cannot be otherwise for one whose hardships and privations have taught him the supreme lesson of patience and forbearance. The ass-drawn vehicle jogs steadily along the asphalted highway, but the group huddled precariously on the frail cart eye the long road to the market with an air of patient resignation. The land conscious Hindu will not alter his way of life. Rural simplicity and a philosphic resignation to the trials of existence are as much a part of his mental make-up as they are for his compatriot, in distant India. He is glued to the soil with a dedication—the outcome of centuries of agricultural tradition.

Among the more prosperous and wealthy East Indians a political consciousness arises from the veiled nationalism that is expressing itself in the Negro population. Events in Africa, a continent to which the West Indian Negro is identified by race and origin, are having their repercussion on the otherwise indifferent Negro in the Caribbean. It is possible that the slogan 'Africa for the Africans'

will express itself in the West Indies as 'West Indies for the Negroes'. The hitherto peaceful 'co-existence' is likely to be disrupted by nationalism and the struggle for political power by groups who are both non-indigenous to the West Indies and the Caribbean. The Negroes are descendants of imported African slaves. The East Indians were brought to the West Indies and the Guianas as laborers. The revival of Hinduism and interest in the vernaculars are intensifying the East Indian's cultural ties with India from which he emigrated a little more than a century ago. The Negro on the other hand is a Christian, uses English as the medium of expression, knows not a single African language and has accepted the western way of life in all its entirety. He is much more an alien to Africa than is the East Indian to India and both groups differ in cultural outlook and consciousness of racial origin.

The predominant East Indian group is the Hindu and not the Muslim whose religion has had an appeal to the Negro in Africa where the Islamic Arab propagated his faith as a conqueror. In Trinidad, the Muslim forms an insignificant part of the total population, but his commendable philosophy of brotherhood is imperative for the promotion of racial harmony among the islanders. The Hindus have resisted assimilation, and their presence in large numbers has helped in the awareness of a religion, the pursuit of which leads to the consciousness of an ultimate reality. Religion for the Hindu is experience or attitude of mind. It is not an idea but a power, not an intellectual proposition but a life conviction. The Hindu in Trinidad participates in the life of the island with the growing awareness that he has a glorious heritage. His philosophy of tolerance and understanding enables him to endure his physical hardship with stoicism, and his mental anxieties with equanimity. Social and political upheavals will not disturb his serenity. The East Indian in Trinidad came to work, and his descendant is determined to stay.

BACKGROUND AND ACADEMIC PREPARATION OF SOCIAL SCIENCE TEACHERS IN THE HIGH SCHOOLS OF KANSAS, WITH SPECIAL EMPHASIS ON GEOGRAPHY TEACHERS

HAROLD V. SARE
Kansas State Teachers College

Introduction

THE Kansas State Teachers College of Emporia has sponsored several studies of the background and academic preparation of the secondary teachers in the public high schools of Kansas. The study of social science teachers[1] upon which I am reporting to you is one of those studies. Other studies which have been completed cover science,[2] mathematics,[3] and business teachers.[4] The purposes of these studies are:

[1] Harold V. Sare (with the assistance of Wallace Browning), "Background and Academic Preparation of the Social Science Teachers in the High Schools of Kansas, 1956-1957," *The Emporia State Research Studies*, Vol. 7, December, 1958.

[2] Weldon N. Baker and Merle E. Brooks, "Background and Academic Preparation of the Teachers of Science in the High Schools of Kansas, 1955-1956," *The Emporia State Research Studies*, Vol. 6, December, 1957.

[3] John M. Burger, "Background and Academic Preparation of the Mathematics Teachers in the

(1) to determine statistically the actual preparation of the teachers and to relate this to the subjects they taught;
(2) to provide information which will be useful in evaluating curricula and instruction in the public high schools;
(3) to provide knowledge of strengths and weaknesses of the academic preparation of teachers in order that college curricula for teacher training might be improved;
(4) to provide information on the basis of which better student advising can be accomplished, and to assist the student in vocational placement; and
(5) a general curiosity about the background and academic preparaion of the teachers. In this sense the study should provide evidence to prove or refute many commonplace generalizations about secondary education.

In the study of social science teachers, the records of 1,007 teachers[5] who taught on the secondary level (grades 9-12) in 603 public high schools of Kansas during the academic year of 1956-57 were analyzed. The data were compiled from the Principal's Organization Reports, which are the official reports required by the Department of Public Instruction of Kansas, and the teachers' official college transcripts of courses and grades, which are also required to be filed in the Department of Public Instruction. The data from these sources were placed on I.B.M. cards and I.B.M. procedures were used to determine significant relationships.

Several difficulties were encountered in gathering the data for this study. In the first place, the transcripts on file in the Department of Public Instruction in some cases did not represent the total academic preparation of the teacher. It was also difficult to classify courses taken since the various colleges obviously have not standardized their course offerings. Another difficulty encountered was determining the academic majors of the teachers. A number of the transcripts did not record this information. It is believed, however, that these difficulties should not detract significantly from the validity of the study. The complete report in the *Research Studies* shows how these items are of minimal significance to the overall study.

This paper will present the general results of the study of social science teachers and more specifically the academic preparation of geography teachers in Kansas.

General Results of the Study

Background Information. It is apparent that academic preparation of teachers should be approached in reference to the subjects the teachers are assigned to teach. Thus, one of the first concerns of the study was to determine the social science course offerings in Kansas public high schools.

Kansas schools emphasize United States history, United States government, and world history, a concentration reflected in the college program of the teacher. During the academic year in which the study was made, 521 of the 603 schools offered United States history, 483 offered United States government, and 333 offered world history. Only 54 offered international relations, 60 offered geography, and 85 offered economics. Other courses in social science offered were citizenship and general social science subjects, such as marriage and the family and sociology.

In many of the schools of Kansas the teacher is expected to teach in more than one subject area. Thus the first and second teaching fields[6] were determined.

Public High Schools of Kansas, 1957-1958," *The Emporia State Research Studies*, Vol. 7, March, 1959.

[4] Charline Fulton Jeffers, "The Status of Teachers of Business Subjects in the Kansas Secondary Schools for 1956-1957," unpublished master's thesis, Kansas State Teachers College, Emporia, Kansas, May, 1959.

[5] There was a total of 1,026 social science teachers on the secondary level in public schools in Kansas during the academic year 1956-57.

[6] The first and second teaching fields were determined by evaluating the courses taught by the teacher. If the teacher taught more social science than any other subject area, social science was

A majority of the social science teachers (625, or 62 per cent) taught social science as a first teaching field. A number of other disciplines were represented in the first teaching field classification; however, no one field in itself was significant as far as numbers of teachers were concerned. For instance, 89 teachers (about 9 per cent) had English and/or speech for a first teaching field, while 78 (about 8 per cent) taught physical education as a first teaching field. There was a relatively large total number of teachers (346), however, who taught social science as a second teaching field.

The most significant second teaching field for those who had social science as a first teaching field was physical education. One hundred fifty taught physical education as a second field, while the combination of science and mathematics was the next in significance, involving 83 teachers.

Since Kansas has a large number of small schools, a large percentage of teachers were teaching in small schools. Six hundred seventy-eight teachers (about 67 per cent) of the total number of teachers taught in schools that had between 25 and 200 students.

It was also found that the majority of the teachers were men—787 men compared to 220 women. Social science teachers in Kansas were found to be rather young as a group, with 63 per cent of them having ten years or less teaching experience. Fifty-eight per cent of the men were between the ages of twenty and thirty-five. The women as a group were older than the men, with 73 per cent of them thirty-five years and older.

Academic Preparation. All of the social science teachers studied held college degrees. Seventy-nine per cent of the total received those degrees in Kansas. Oklahoma was the greatest single out-of-state source of social science teachers. Sixty per cent of the teachers received their degrees within a twelve-year period preceding the 1956-57 school year.

Thirty-six per cent (364) of the teachers had earned master's degrees, most of which were conferred by Kansas colleges and universities. Fifty-seven per cent of the master's degrees were conferred within an eight-year period prior to the 1956-57 academic year.

As would be expected a large number of the teachers (45 per cent) had academic majors in the social sciences. Physical education majors constituted the second largest group, representing about 20 per cent of the total. The other teachers had academic majors in a variety of areas such as science, mathematics, business English, industrial arts, and basic economics.

Regardless of the academic major there were several college courses in the social sciences that were taken by most of the teachers. Ninety per cent of them completed courses in American history; 85 per cent took courses in United States government, 80 per cent finished courses in world history, and 70 per cent received college credit in economics. The usual number of credits in these subjects ranged from three to six semester hours.[7]

listed as his first teaching field. The second highest number of courses taught in a particular field other than in the first teaching field was listed as the teacher's second teaching field. For instance, a teacher may teach mostly social science. This would be his first teaching field; but he may also teach two classes in science. The latter would be the second teaching field. In some instances teachers were teaching an equal number of courses in two fields, such as two courses in social science and two in science. In these cases, a distinction was made between first and second teaching fields by referring to the teacher's major in college. If the major corresponded with one of the fields, and most usually it did, that field was classified as his first teaching field.

[7] State certification requirements for the standard high school require that a social science teacher should have completed twenty-four hours in the general area of social science and six hours in each subject taught within the social science area.

A large number of teachers had received credits in American history, world history and government beyond six academic hours. Not many, however, completed work beyond 20 hours' credit in any one of these subjects.

Some academic areas within the social sciences were not very well represented in the academic preparation of the teachers studied. For instance, only 44 per cent of the teachers completed courses in geography, and only 23 per cent of them finished course work in philosophy. However, geography was not taught in very many of the high schools during the year studied, and philosophy, to the best of our knowledge, was not taught at all.

An analysis was also made of the relationship between courses taken in college and the subjects taught by the teachers in high school. It was found that approximately 90 per cent of the American history teachers had completed courses in college termed American history. Seventy-two per cent of the American history teachers had courses in economics, 78 per cent completed courses in world history, 83 per cent finished courses in government, and 78 per cent received credit in sociology.

Seventy-nine per cent of the world history teachers had completed courses in world history. Eighty-five per cent of these teachers had also received credit in American history, 76 per cent had completed courses in sociology, 67 per cent completed courses in economics, and 83 per cent received credit in government. Only 9 per cent of the world history teachers had received credit in eastern and Asiatic history.

Eighty-five per cent of the government teachers had received credits in government, for the most part in American national government. Seventy-one per cent of the government teachers completed courses in economics, 80 per cent took courses in sociology, 85 per cent received credit in American history, 78 per cent in world history and 19 per cent completed courses in international relations.

The teachers of international relations seem to have been the poorest prepared, since only 31 per cent of them completed courses specifically termed international relations. Seventy-five per cent of them, however, completed courses in economics, 84 per cent took college courses in sociology, 88 per cent completed courses in world history and 81 per cent received credit in government in general.

The economics teachers as a body seem to have been the best prepared since 98 per cent of them had received college credits specifically in economics. Eighty-three per cent of them received college credits in sociology, 95 per cent finished courses in American history, 67 per cent completed courses in world history and 86 per cent received college credit in government.

The teachers' average grades in college were also examined. The analysis was made on the basis of the academic major. The social science majors, by far the largest group, had grade averages (overall and in social science) which ranged from "A" to "C"; however, the majority of these teachers (53 per cent) had an overall average of "B." Forty-two per cent had an overall average of "C." The physical education majors constituted the second largest group of social science teachers. A majority of them (66 per cent) had an overall average of "C" and thirty-three per cent had an overall average of "B." Other academic majors varied between the "B" and "C" averages. There were, as would be anticipated, a small number of teachers in all areas that had a grade average of "A."

The Geography Teacher

Geography is one of those academic areas that is not too strong, relatively

speaking, in the academic background of the Kansas social science teachers. It is also a fact that not very many high schools (grades 9-12) offer courses termed geography. We found that only 60 schools (out of 603) offered courses in geography, and that there were only 61 teachers classified as geography teachers. Most of these teachers were men—52 of the 61 teachers.

It is interesting, since most high school social science courses in Kansas are oriented toward the United States, that there were no schools offering courses labeled geography of the United States. There were 35 schools that offered courses termed world geography. However, 25 schools offered unspecified courses in geography, of which we had no way of determining the content. It should be pointed out that the Kansas junior high schools do teach geography in their core curriculum.

As indicated above the academic training of all the teachers in the subjects of sociology, geography, American history, world history, government, economics and philosophy was analyzed. It was found that the two weakest areas in the academic background of the teachers as a group were philosophy and geography. Six hundred sixty-five teachers, or 66 per cent of the total, took no courses termed geography. Philosophy was even worse with 774 teachers, or 77 per cent of the total, who had taken no courses in this subject.

Of the teachers that took course work in geography (342), most of them (161) took only a three-hour course in the subject. Only 122 teachers took more than three hours in geography and most of them took no more than 6 hours.

The relationship between the age of the teachers and courses taken in geography was also analyzed. It was found that a greater percentage of the social science teachers between the ages of 31 and 45 took courses in geography than those that were younger or older. Forty per cent of those teachers in the age bracket 31-45 took course work in geography, while only 31 per cent in the age bracket 20-30 completed courses in geography. Of the older teachers only 27 per cent in the age bracket 46-60 completed course work in geography.

An analysis reflecting the relationship between subjects taught and geography courses taken in college was made. It was found that 38 per cent of the American history teachers, 30 per cent of the world history teachers, 33 per cent of the government teachers, 36 per cent of the economics teachers and 34 per cent of the international relations teachers have taken courses in geography.

Of those teachers teaching geography it was found that only about 51 per cent had taken courses in college specifically termed geography. However, 72 per cent of these people studied economics, 80 per cent had studied sociology, 75 per cent had taken American history, 78 per cent had completed courses in world history, and 81 per cent had studied government.

In Kansas it appears that geography is not too significant in the high school curriculum. Therefore, geography has not been emphasized in the academic preparation of teachers in college. Or, is it that since geography has not been much emphasized in college it has not been given much attention in the high schools? How can this dilemma be removed?

Are You Going to Cincinnati in Six Months?

The 45th Annual Meeting of the National Council for Geographic Education will be held in Cincinnati, Ohio, on November 25-26, 1960. Will we see you there?

TEACHERS OF HIGH SCHOOL GEOGRAPHY NEEDED: CAN YOU QUALIFY?

TWO YEARS AGO the board of education re-examined its program of geography in the Chicago high schools, and, as a result, last year it instituted a course in world geography that would normally be taken in the sophomore year. All graduates of Chicago high schools have the choice of taking either world geography or world history, but they must take one or the other. The best guess is that Chicago will need about 100 *full-time* geography teachers in the next year or two.

Of course in many instances, the geography teacher who has other skills will be asked to teach a class or two in geography and something else in a related field such as history of economics. If some of the teachers are only part-time geography instructors, then more than 100 would be hired. It is sufficient to say that, as of now, Chicago school system would hire about 100 full-time geographers at once if they are available. If they are not found within the next few years, the whole program may have to be abandoned. At present, anyone who has had a single course in geography (and is an accredited teacher in the system) is liable to be drafted to teach geography.

The requirements to obtain a certificate in geography to teach in Chicago are set forth by the Board of Education as:

"Geography:

A candidate taking the geography examination must present thirty-two semester hours of college credit in geography and related fields. A minimum of eight semester hours must be in *PHYSICAL GEOGRAPHY:* elements of geography, physical geography, oceanography, geology (basic processes, not historical), meteorology, climatology, cartography, or map and air photo interpretation; eight semester hours in *REGIONAL GEOGRAPHY* covering major parts of the earth's surface, e.g. Caribbean, Eastern United States, Europe, British Isles; and eight semester hours in *TROPICAL HUMAN GEOGRAPHY:* economic geography, global geography, social geography, transportation, geography, urban geography or conservation. The balance of the thirty-two semester hours may be in any geography the candidate may elect to submit or may be from *RELATED FIELDS* in courses approved by the Board of Examiners." (Adopted December 30, 1958.)

In addition, the student needs a minimum of 20 credit hours in education and must pass a certifying examination in geography. The next examination will be given in Chicago on April 25, and the last day for applications is April 11. Applications to take this examination should be directed to the Board of Examiners, Board of Education, 228 North La Salle Street, Chicago, Illinois.

There is no color or race problem of any kind, and any candidate will be hired who is a United States citizen and passes the certifying examination. There is also a physical examination given by the board, but nearly anyone who can breathe passes the physical.

The minimum starting salary (with a B.A. and no teaching experience) is $5,000 with annual increments of $250 a year for 10 years. For a masters degree the starting salary is $5,500, for a masters plus 30 credit hours it is $6,000, and for a Ph.D. with no teaching experience the starting salary is $6,500.

If you need any further information, please write to Dr. C. Wallace Dierickx, Associate Professor of Geography, Chicago Teachers College, 6800 Stewart Avenue, Chicago 21, Illinois.

THE USE OF PROBLEM SOLVING GROUPS IN TEACHING GEOGRAPHY

HARRIS M. TAYLOR
Taft Junior High School, Washington, D.C.

As THE IMPORTANCE of geography is brought into sharper focus by world and national events, curriculum builders are including more geography in the various courses of study. It is a challenge to the classroom teacher to devise and use appropriate methods to meet student demands for more geographical information, for enthusiasm or interest can be destroyed in any subject, no matter how important or essential, by poor teaching methods. The use of various "methods" becomes increasingly important when we realize that all learning must be motivated and that learning is most effective when it is purposeful, challenging, satisfying and when it involves a maximum number of the senses. One method which can meet the criteria mentioned above is the use of group procedures. The problem solving group, which is one facet of the group process, lends itself to the teaching of geography.

It has been said that working in groups "is an organized way of wasting time." This may be true in many situations, if tried by people unskilled in using group procedures. It is also true that any "method" may be ineffective if it is not employed in a correct manner.

There are five principles that a teacher should keep in mind as he employs problem solving groups:

1. The class should be analyzed first so that meaningful, congenial groups can be established.
2. The teacher must teach the skills necessary for working in groups. The teacher cannot assume that students have these skills.
3. The problems to be solved first should be of a rather simple nature to assure the child success in his initial work.
4. The groups should be highly structured until the students become very skilled in the use of the procedures.
5. It should be remembered that, although the development of group skills is important, the method is designed primarily to teach subject matter, in this case, geographical content and skills.

Organization

The class should be organized in groups or committees of from four to seven children. A larger number than seven tends to be unwieldy and hampers communication. Several leadership roles should be established on a rotating basis. The group should select a chairman. His duties would include guiding the discussion in such a way that work moves smoothly toward a solution of the problem. He tries to afford each member an opportunity to make contributions. In addition a recording secretary should be selected. His duties would include preparing a report of the findings for presentation to the entire class. An observer should also be selected, who, although an integral and participating member, reports on how the various members work. Another leadership role would be that of blackboard recorder. His duties would be to record the ideas and suggestions of the students as they work toward a solution of the problem. It is recommended that a portable blackboard be furnished each committee. The group can work more effectively if it can see before it the problem, the main ideas discussed, and progress toward a solution of the problem.

After each committee has had ample time to solve the problem, the recording secretary reads the report of the group's findings to the entire class, after which the class discusses the report and asks questions. A group test may be used as a follow-up.

Each person in a leadership role is required to submit a written report. As these leadership roles rotate, each person in the committee will have an opportunity to submit a report on which he individually will receive a mark. The group as a whole receives a mark on the solution of the problem.

Physical Arrangements

The students should be arranged about the portable blackboards in a semicircle so that each student has a clear view of the blackboard. The committees should be separated by as much space as possible to reduce interference with others in the room. Paper should be provided for taking of notes or jotting down ideas.

Teacher Preparation and Participation

The teacher should be well trained in the use of group procedures. Indeed, the success of this method depends upon the training and skill of the teacher. This method requires a great deal of planning by the classroom teacher, for he must make preparation (1) to select problems which can be effectively used to teach geographical concepts and skills and (2) to teach group skills necessary to accomplish the desired goals and objectives.

The teacher assigns problems to the various committees as a result of teacher-pupil planning. The problems should be broad in nature and provide great latitude to encourage pupil initiative and investigation. For example, the class may be studying a problem on "Agricultural Products of the United States." The general question may be stated in the following manner:

> "What are some of the problems which farmers face?"
> "How do they solve them?" "What solutions can you offer the farmer?"

Various committees may work on different phases of the problem: the problems of growers of grain, or truck crops, or livestock, or tree crops. In some instances more than one group may work on the same phase of the assignment if it is sufficiently broad or lends itself to various interpretations. The teacher must provide reference materials appropriate to the problem: magazines, pictures, maps, charts, globes, reference books, resource persons. Ample time for research must also be provided. The students should be encouraged to make models, drawings, pictures, maps or charts to illustrate their solution to the problem.

The second area of teacher presentation includes instruction in the way to write reports and the type of information desired in the various reports. The teacher must teach the student problem solving techniques in addition to how to select and evaluate research materials.

Advantages

A group has greater creative potential than any single member of a class would have. It allows the varied experiences of the members to be brought together to solve the problem. This method provides an opportunity to practice library investigation, develops skill in problem solving, encourages tolerance of the ideas of others, and provides for teamwork. It presents an opportunity for the child to write meaningful compositions and reports. It places the child in an informal learning situation and provides the teacher with an opportunity to use the various forces generated in a group situation.

Evaluation and Summary

The use of problem solving groups can be very effective when used with students who can work independently or with a minimum of teacher supervision. It works especially well with children on the secondary school level. The selecting, organizing and structuring of committees

is very important. Much teacher disappointment with the use of group procedures stems from poor organization or inadequate training of the students in how to work together.

Four major limitations may be evident in the use of group procedures: (1) time, (2) inadequate physical facilities, (3) student marks, and (4) teacher control. The use of committee procedures takes more time than many other types of method; however, the outcome more than justifies the use of additional time. Many school rooms are not built to provide space for committee work, but the use of portable screens to divide off the room may help to alleviate much of this problem. However this method also requires good teacher control for several students are talking at the same time. Much of this can be reduced by the teacher visiting the groups, working with them and reminding them to keep their tones modulated. Marking the individual child will also present problems, but rotating leadership roles requiring individual reports helps to solve a part of this problem.

Some teachers say this method is nothing new. This is true. It should be remembered, however, that the use of problem solving groups involves more than placing 4 to 7 children together and telling them to work on some area of subject matter. On the contrary, it involves adequate planning, problem solving, evaluation, critical and integrated thinking, perfecting of research and communicative skills, and the utilization of the various forces generated in a group to more effectively teach geographical concepts and skills.

THE NATIONAL COUNCIL AT WORK

The State Coordinators form one of the most active and important groups within the framework of the National Council for Geographic Education. This working organization is headed by the Director of Coordinators, a person appointed for a three year term by the Executive Board. The Director in turn appoints the various state or regional coordinators, and promotes and supervises their work in all ways deemed advisable in order to promote the objectives of the Council.

The State Coordinators work with numerous individuals and groups. They keep in touch with state educational plans and programs; assist those persons interested in the improvement of geographic teaching; watch for occasions upon which action might be taken to promote the standards of geography teacher-training and certification at both the elementary and secondary level. They also publicize within their respective states the time of the annual meetings and any National Council awards and honors received by teachers of the state. During the past year some of the special activities carried on by various State Coordinators have been: publication of bulletins and newsletters; preparation of articles for education magazines; promotion of guest lecturers for important meetings; solicitation of articles for the JOURNAL OF GEOGRAPHY; participation in educational television and radio programs; sponsorship of field trips; preparation of exhibits for educational meetings; and the making of analyses of geography and social studies textbooks.

Are you acquainted with your Coordinator? He or she would be a good person to know. They cannot, however, achieve their aims and objectives without your help. They will welcome your suggestions and aid in bringing about a better understanding of the Council and its work. The Director of Coordinators is Herbert H. Gross, Concordia Teachers College, River Forest, Illinois. The various state and regional coordinators are:

Alabama—J. M. Richardson, Alabama Polytechnic Institute, Auburn
Arizona—George T. Renner III, Arizona State University, Tempe
Arkansas—Mary L. Hileman, Arkansas State Teachers College, Normal Station, Conway
California—William G. Byron, Los Angeles State College, 5280 Gravois Avenue, Los Angeles 32
Colorado—Engenia W. Tuttle, Box 24, Estes Park
Connecticut—George M. Howe, 700 Main Street, Hartford
District of Columbia—Frances Hanson, 9315 Adelaide Drive, Bethesda, Maryland
Florida—Mary Bostick, Demonstration School, Florida State University, Tallahassee

Georgia—James A. Barnes, University of Georgia, Athens
Idaho—Harry A. Caldwell, University of Idaho, Moscow
Illinois—Kermit M. Laidig, Illinois State Normal University, Normal
Indiana—Alfred H. Meyer, Valparaiso University, Valparaiso
Iowa—Clyde Kohn, State University of Iowa, Iowa City
Kansas—Huber Self, Kansas State College, Manhattan
Kentucky—J. R. Schwendeman, University of Kentucky, Lexington
Louisiana—Bonnie Mae Smith, City Public Schools, Lake Charles
Maine—Myron E. Starbird, Farmington Teachers College, Farmington
Maryland—George Beishlag, State Teachers College at Towson, Baltimore 4
Massachusetts—Elizabeth Eiselen, Wellesley College, Wellesley 81
Michigan—Robert J. Goodman, Wayne State University, Detroit
Minnesota—Hildegard Binder Johnson, Macalester College, St. Paul
Mississippi—Carol Brumby, Delta State Teachers College, Cleveland
Missouri—Sidney E. Ekblaw, University of Kansas City, Kansas City
Montana—Nicholas Helburn, Route #3, Bozeman
Nebraska—George S. Corfield, Nebraska Wesleyan University, Lincoln 4
Nevada—Fritz Kramer, Box 9086 University Station, University of Nevada, Reno
New England—George M. Howe, Travelers Weather Service, 700 Main Street, Hartford 15, Connecticut
New Hampshire—Albert S. Carlson, Dartmouth College, Hanover
New Jersey—Daniel Jacobson, Montclair State College, Montclair
New Mexico—Leroy Gordon, University of New Mexico, Albuquerque
New York—Howard H. Flierl, State University of New York, New York State College for Teachers, Albany
North Carolina—Robert Cramer, East Carolina College, Greenville
North Dakota—Viola M. Bohn, 915 Avenue F East, Bismarck
Ohio—Aletha B. Parks, 3763 Grovedale Place, Cincinnati; Evelyn G. Weston, Kent State University, Kent
Oklahoma—John W. Morris, University of Oklahoma, Norman
Oregon—Hazel Newhouse, Gresham High School, Gresham
Pennsylvania—Katherine Montgomery, Apt. #11, Crome Apartments, 133 Harrison Avenue, Greensburg
Rhode Island—Marion L. Wright, Rhode Island College of Education, Providence
South Carolina—Julian J. Petty, University of South Carolina, Columbia
Tennessee—Marie Harrison, East Tennessee State College, Johnson City
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Washington—Robert Funderburk, Central Washington College, Ellensburg
West Virginia—Sam E. Clagg, Marshall College, Huntington 1
Wisconsin—Clarence Olmstead, University of Wisconsin, Madison
British Columbia—J. Lewis Robinson, University of British Columbia, Vancouver
Ontario—J. W. Hamilton, Northview Heights Collegiate, 550 Finch Avenue West, Toronto

JOHN W. MORRIS, *President*

BOOK REVIEWS

Willis Lindquist. **Alaska, the Forty-Ninth State.** Illustrated by D. A. Hutchison. Foreword by Senator Gruening. Whittlesey House, McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, New York, 1959. 111 pages with table of contents, illustrations and index. $3.00.

This brief sprightly book, for teen-agers and children somewhat younger, contains a lot of information for adults. It helps fulfill a need in the social studies of understanding not only Alaska but the entire northlands.

The introduction by Ernest Gruening, U. S. Senator from Alaska, is full of pertinent facts.

The author uses direct comment and quotations in bringing alive a colorful land. That he is widely travelled and a successful author is evident throughout the book. Mr. Lindquist traces the history of Alaska through the Russian and territorial periods to statehood. The chapter headings, some of which are "Saved by the Sea Otter," "Gold by the Ton," "Gateways to the North," "Are Sled Dogs Doomed," and "Where Bush Pilots Fly," give an idea of the coverage.

Primitive conditions are changing. Some Eskimos now use outboard motors, some fly airplanes, and some have modern homes equipped with oil heaters and electronic gadgets. This new

state has native villages, barren wastes, and booming cities. The DEW (Distant Early Warning) line, the vast uncharted areas, the mineral wealth, the wildlife, and the recreational resources stimulate the imagination.

A good two-page map precedes the text. The geographic value of the book might be enhanced by the inclusion of a polar map with parallels, meridians, and various centers of activity of the Arctic, over which is an increasingly dense network of world communication and transportation. This book stimulates the desire for more material on this last great frontier.

MARJORIE SHANK
Southern Illinois University

Educators' Guide to Free Films. Educator's Progress Service, Randolph, Wisconsin, 1960.

The *Educators' Guide to Free Films* has a definite value to educators in all fields and in all grades. It is especially valuable to the school system that does not maintain an audio-visual department of its own. In the larger cities where such departments are maintained, this *Guide* may be used to supplement the facilities already available.

The present edition of the *Guide* contains 4,223 titles of free films available for classroom use. It is imperative to be aware that previous issues of the *Guide* are obsolete and should be discarded. The new films are marked with an asterisk, so that they are easily distinguishable. Films should be ordered directly from the sources named and not from Educators Progress Service.

The films are listed under various areas of the curriculum, such as history, geography, science, sports, transportation, and many others. There are 500 pages of film listings. Under each listing the following information is given: title, description of contents, size, whether silent or sound, date of release, running time of film, and name and address of the distributor and its branch offices. In some instances appropriate grade levels are suggested so that a film containing material for higher grades or college would not be ordered unwittingly by a primary teacher.

In addition to the film listings, there is a cross index, generally under the main headings, which refers the user to more films in closely related fields. Films are also indexed according to title and subject. The source and availability index is of prime importance since it specifies the terms and conditions of the lending of the films and quotes the availability of the film. This index also suggests the time which is needed to fill requests for specific films.

Since audio-visual materials are of such vast importance in education today, a copy of this *Guide* is virtually a necessity in the offices or libraries of our school systems, so that teachers may refer to its contents.

EMILY H. BAKER
Harris Teachers' College
St. Louis, Missouri

Zaki Naguib Mahmoud. **The Land and People of Egypt.** J. B. Lippincott Company, East Washington Square, Philadelphia 5, Pennsylvania, 1959. 127 pages with photographs, a map, a table of contents, and an index. $2.95.

Zaki Naguib Mahmoud is Egyptian. He has lived and lectured in the United States and now teaches at the University of Cairo.

In a scholarly and rather interesting manner, the author unfolds the history and the various cultures of Egypt, describes some of its geography, and explains its complicated social, economic, and political development through the ages. Sixty centuries of recorded history are described in this presentation.

The character of the Egyptian people has been shaped by the river that keeps them alive. The chief occupation of the people was, and still is, agriculture. Truly, as Herodotus, the ancient Greek historian, has said, "Egypt is the gift of the Nile."

Mahmoud emphasizes that Islam, the proper word for so-called Mohammedanism, is a monotheistic religion. Allah, the Arabic word for God, is the one and only God. About ten per cent of the people today are Christians.

The author stresses that Egypt is now for the first time, after so many centuries of foreign rule, a fully independent country. The present rapid growth of industry started during the First World War.

Seemingly, Egypt is making great strides in combating illiteracy, even though a little more than seventy per cent of the nation cannot read or write. Also, revivals and advances are being made in science, literature, and art.

Not much pure geographic material is given and the one map is very poor. These deficiencies, notwithstanding, *THE LAND AND PEOPLE OF EGYPT* is a good addition to the Portraits of the Nations Series.

RALPH S. HARRIS
Urbana Junior High School
Urbana, Illinois

Dorothy Childs Hogner. **Conservation in America.** J. B. Lippincott Company, Philadelphia, 1958 (author's copyright). 240 pages. $3.75.

Those who accept the title of this book at face value are due for disappointment—it is certainly not a comprehensive treatment of American resources and conservation, as the title would imply. It is in fact, a juvenile reader, treating only selected aspects of nature and wildlife preservation. The books content is further obscured by a sub-title, "The History and Preservation of Our Natural Resources."

The book has much to recommend it to young readers, and in several parts it has solid information for adults as well. Although the chronology is loose, and organization rather vague, many episodes are highly instructive and extremely well written.

Chapter 7 on "Wildlife" is the longest and best treatment in the volume (57 pages). Here the author is apparently in her element. Here she sets forth in simple, lucid style such important wildlife management concepts as "habitat and carrying capacity," predation, "cropping," regional and international cooperation, "refuges," etc. She affords the reader a clear introduction to such pieces of Federal legislation as the Pittman-Robertson Act, the Dingell-Johnson Act, P.L. 566, and the Water Pollution Act. These discussions are praiseworthy contributions to conservation education.

However, on other aspects of conservation, the book leaves much to be desired. In her engagements with minerals (7 pages), land (14 pages), planning, multiple-use, hydrology and hydraulics, etc., the author treads lightly, on ground apparently quite strange to her. Her slight of mineral resources is made even more obvious by devoting most of the allotted space to coal and mentioning little else.

The book contains no photographs, maps or charts. It is decorated with simple, but attractive, black line drawings—on the frontispiece and at the head of each chapter.

RUBEN L. PARSON
Northern Illinois University

Theo L. and Sarah Jane Hills. **Canada.** Fideler Company, Grand Rapids, Michigan, 1959. 160 pages with pictures, glossary, table of content, and index. 1-4 copies of one title $3.28; 5 or more copies of one title $2.46.

This book on Canada is one of a series published by Fideler and Company on "Life in Other Lands." Very commendably they have sought to obtain geographers to write the book and to act as editor. Furthermore they have expressed some very important statements about education in the introductory preface to the teacher. Despite this excellent introduction, however, the publishers have required that this book fall into a pattern which is not necessarily in accord with the preface. For instance they indicate in a fly leaf attached to the cover of the book that a committee method of studying geography is a good one. This is an unwarranted statement since the committee method for the initial study of a book is still questionable. Secondly, they indicate that captions underneath pictures are good, but it has been shown that questions underneath pictures in a book are often preferable and more stimulating. Thirdly, the plan of the book which deals with the regions of Canada under separate headings such as land, climate, people, farming, forests, etc., is chosen in preference to a more desirable comprehensive regional study in which each region is studied to show how land, climate, people and occupations are interrelated in any one area. Fourthly, it has yet to be shown how arts and crafts, sports and recreation, education, discovery, settlement and government are a relevant part of Geography.

Within this rigid framework of prejudged educational theory, the authors are to be congratulated on the way in which they have enlivened the book. They have chosen some excellent pictures, have selected some good exercises and questions and have written the text extraordinarily concisely. No particular grade level was indicated for the book as it is intended to act as a resource volume to stimulate interest.

Although this book has some of the geography of Canada in general outline and accurately, it has sometimes failed to be geographical because of the brevity with which much fundamental material has to be covered. It tends to be factual rather than emphasize relatedness of facts. The implications of the land conditions, the climatic conditions, and soil conditions in the lives of the people are not brought out nor are relationships stressed by giving details of life throughout the year.

The criticisms, however, offered of this book are not directed to the authors or even to the editor but to the company which sets out with a particularly rigid and somewhat obsolete ideal of education and requires its authors to fit into this pattern. The pictures, text and maps could have been so much more ably used if the authors had been given freedom to be educational and completely geographical.

N V. SCARFE
The University of British Columbia

Atlas from Communist China

The Library of Congress has acquired negative microfilm of a high quality general reference Atlas of China: Chung-Hua Jen Min Kung Ho Kuo Ti T'u Chi (Atlas of the People's Republic of China), Shanghai, October, 1957. It contains 152 pages approximately $10\frac{1}{2} \times 15$ inches. Black and white film does not, of course, reproduce legibly the color tints and layers of some map patterns, but administrative boundaries, contours, drainage, place names, and many symbols and patterns for data on climate, resources and economic activities are quite clear. The entire work is in Chinese. Positive copies of the microfilm may be purchased for $5.00, including postage, from the Photoduplication Service, Library of Congress, Washington 25, D.C.

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GEOGRAPHIC MATERIALS RECEIVED

John C. Caldwell. **Let's Visit India.** The John Day Company, Inc., 210 Madison Avenue, New York, New York, 1960. 96 pages including index and table of contents. Illustrated. $2.95. Ages 8-12.

Alan Jakeman. **Getting to Know Japan.** Coward-McCann, Inc., 210 Madison Avenue, New York, New York, 1960. 64 pages including index and pronunciation chart. Illustrated. $2.50. Ages 8-12.

Bern Anderson. **Surveyor of the Sea: The Life and Voyages of Captain George Vancouver.** University of Washington Press, Seattle 5, Washington, 1959. 274 pages including table of contents, index, bibliography, appendix and 10 illustrations and 5 maps. $6.75. Adult.

James M. Smythe and Charles G. Brown. **Elements of Geography.** St Martin's Press, Inc., 175 Fifth Avenue, New York 10, New York, 1960. 285 pages with preface, table of contents, list of 172 maps, charts, diagrams, photographs and illustrations, introduction and index. $3.00.

J. Russell Smith and Frank E. Sorenson. **Our Neighbors At Home.** The John C. Winston Company, 1010 Arch Street, Philadelphia 7, Pennsylvania, 1960. 250 pages with index. $3.52. Third grade.

L. Dudley Stamp. **A Regional Geography, Part I, The Americas.** Longmans, Green & Company, Inc., 119 West 40th Street, New York 18, New York, 1960. 274 pages with index. $4.25.

A. E. Smailes. **North England.** Thomas Nelson and Sons Ltd., Parkside Words, Edinburgh 9, Scotland, 1960. 324 pages with index, table of contents and plates. 50/-

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Robert H. Fuson and John R. Ray, Jr. **Problems in World Cultural Geography: A College Workbook.** Wm. C. Brown Company Publishers, Dubuque, Iowa, 1960. 276 pages with appendices and 79 full-page base maps. $4.00.

Authors Fuson and Ray have provided a new medium for teaching regional cultural geography, and therefore have enhanced the possibilities for better instruction and student comprehension. In an organized manner, they have divided the world into two major sections. The first is the *European World*, which includes Europe and all the overseas wings of European culture, and the second is the *Non-European World*, or the regions less influenced by European culture.

Each world is divided into well-defined culture regions and then into sub-regions. The sub-regions provide the core of the WORKBOOK, for in each section is found a set of base maps accompanied by map exercises and questions. The authors continually express the philosophy that the geography of places cannot be fully understod until one knows the people who reside in those places; therefore they stress *Culture*, the phenomenon which is too often deleted in geographical discussions, particularly in the classroom.

The WORKBOOK has several faults. It is both lengthy and expensive, and would seem an impractical tool for a short course. Also, it is divided into culture regions, which makes it difficult to integrate with a textbook, since there are few texts divided in a similar manner. On the other hand, it lends itself well to a longer course where length and expense would not be a problem.

The WORKBOOK is a definite contribution to the teaching and understanding of geography, and those who decide to organize a course around it should not be disappointed with the results.

Sanford H. Bederman

Georgia State College

Armstrong Sperry. **All About the Jungle.** Random House, Inc., New York. 1959. 141 pp. Illustrated. $1.95.

The "jungle" in the title of this volume of the "All about" series refers to the equatorial rain forest, the two terms being used interchangeably throughout the book. The description of the equatorial forests of South America, Africa, and Southeast Asia includes the plant life, the animal life, and some of the forest people.

This volume is pleasing in format, with well-designed pages and readable type. The author has drawn illustrations which are effectively reproduced in black and green. The attractiveness of the book increases the disappointment which follows when the reader examines the content.

The inaccurate statements found in the book are too numerous to quote. Many of the generalizations are too sweeping to be true. In addition, the picturesque and unusual are over-emphasized. For example, in the description of the Congo, fifteen lines are devoted to ivory while all the more important products of the region are briefly listed. The book cannot be recommended for schoolroom or library use.

Katheryne Thomas Whittemore

State University College of Education
Buffalo

Claude A. Buss. **Southeast Asia and the World Today.** D. Van Nostrand Company, Inc., New York, 1958. 189 pages with table of contents, index and selected bibliography. $1.25.

Written by Professor Buss, a Stanford University historian, *Southeast Asia and the World Today* is a small, paper-back volume which should prove valuable as introductory reading for college geography, history and social science students.

This small volume is divided into two parts. Part I, entitled "Southeast Asia," contains ten chapters (87 pages). The first three, covering the area in general, are followed by a chapter each devoted to (1) Indonesia, (2) Malaya and Singapore, (3) Thailand, (4) Burma, (5) Vietnam, Cambodia, and Laos, and (6) the Philippines. The final chapter is entitled "Today's World in Southeast Asia."

Part II, entitled "Readings" (97 pages), contains 27 articles. Some of these are written by famous twentieth century Asians, such as Prime Minister Nehru, President Sukarno, Takin Nu, U Nu, President Ngo Dinh Diem, President Ho Chin Minh, President Ramon Magsaysay and Senator Recto.

The content presents southeast Asian countries in relation to each other and in a world setting with emphasis on current history (covering the last 25 years).

Unfortunately there is only one small map and it is not adequate to show the exact and relative locations of dozens of places referred to and whose locations are so necessary for interest and to understand the text. Another limitation is the failure to provide sufficient geographic information so that the valuable historical ideas can be more meaningful to the readers who are being introduced to this area.

In spite of these limitations, if it is properly used with an atlas, this book is a good learning tool.

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